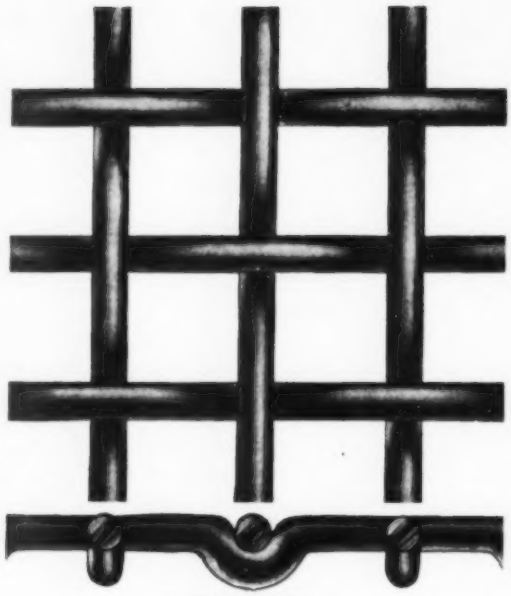
DECEMBER 1950

PIT AND QUARRY

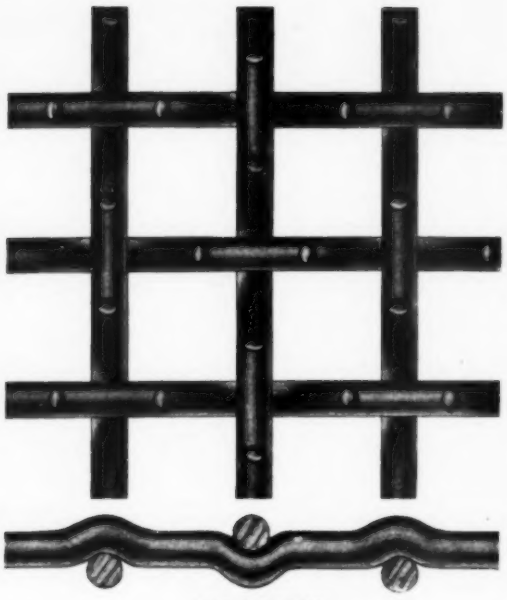
Season's Greetings

to our many friends . . .
May you have a
Merry Christmas and a
Happy and Prosperous
New Year

- PIT AND QUARRY



STA-SMOOTH

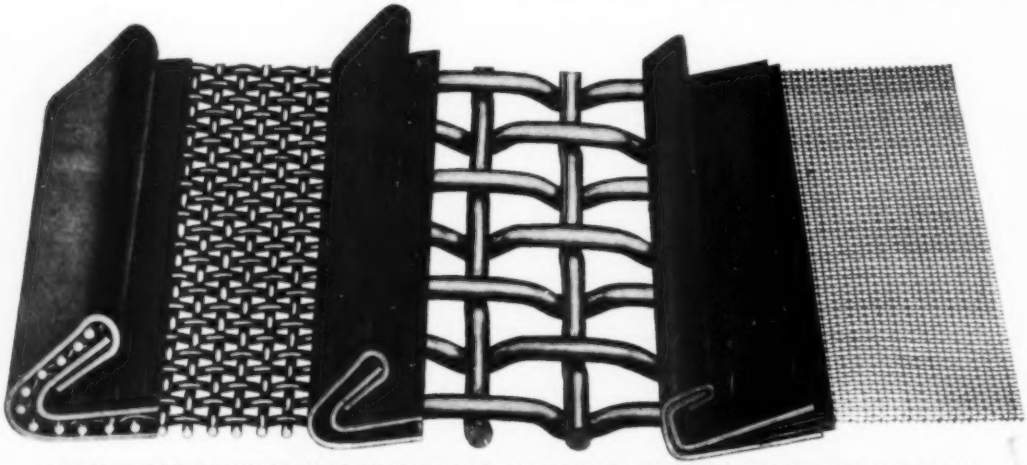


ARCH-CRIMP

SUPER-LOY VIBRATING-SCREEN SECTIONS

SUPER-HARD - - - SUPER-TOUGH - - - SUPER-STRONG

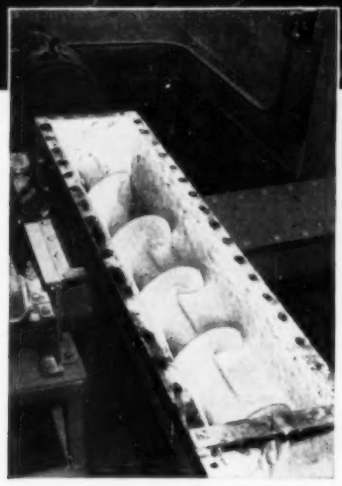
SUPER-LOY SCREENS are made from a high carbon steel specially alloyed to withstand abrasion longer — endure vibration better — resist fatigue to the utmost



ORDER LUDLOW-SAYLOR HOOK-STRIPS FOR ALL TENSIONED VIBRATING-SCREEN SECTIONS.

THE LUDLOW-SAYLOR WIRE COMPANY

634 S. Newstead Ave. ST. LOUIS 10, MO.



Top illustration: 12" diameter Helicoid (screw) Conveyor delivering screened mixed clay to four 12" diameter reversible Helicoid Conveyors discharging into 16 batch bins. Lower illustration: Hydrated lime from bottom of reserve storage silo being conveyed to bucket elevator by Link-Belt Helicoid (screw) Conveyor.

Link-Belt originated and is the largest producer of continuous rolled Helicoid (screw) conveyor. Link-Belt also manufactures many other types of screw conveyors, including sectional flight, in a wide range of diameters and gauges, and in various metals, including stainless steel for conveying jobs where a sanitary metal is desirable. All necessary components such as collars, couplings, hangers, troughs, box ends, flanges, thrusts, drives, etc., are also available to give you one source of supply.

Link-Belt screw conveyors are compact, occupying less space than many other types of conveyors and therefore can be adapted to close clearance locations. Loading is simple—thru spouts or from adjacent conveying mediums. Covers and joints are tight, and dust seals and spring cover clamps keep dirt out, dust inside. Installation and operating costs are low.

Link-Belt engineers will be pleased to study your conveying problem and recommend a conveyor to suit your specific needs. Contact our nearest office for unbiased recommendations.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg. Offices in Principal Cities.

11.874

LINK-BELT
SCREW CONVEYORS

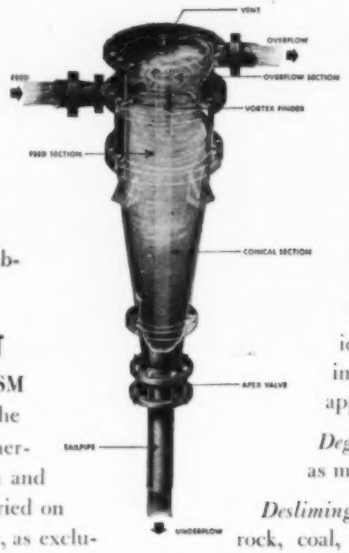
PIT AND QUARRY, December, 1950, Vol. 43, No. 6. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $3 additional for each year. Single copy 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

a new and proven tool in metallic and non-metallic minerals and chemical processing

the DORRCLONE*

(DUTCH STATE MINES CYCLONE)

The DorrClone is a compact cylindro-conical classification unit utilizing centrifugal force in place of gravity. It provides a new method of separating finely divided solids in liquid suspensions and constitutes an important new tool with which to supplement current established practices.



RESEARCH AND DEVELOPMENT

Development of the DorrClone (DSM Cyclone) was begun in 1939 by the Dutch State Mines in The Netherlands, where a continuing research and development program has been carried on since that time. The Dorr Company, as exclusive licensee under the Dutch State Mines patent rights in all fields other than that of heavy media separation, has been actively engaged since 1948 in development work relating to design variables affecting performance, materials of construction and possible fields of commercial use. The result of this program is a carefully engineered unit, capable of controlled and predictable operation.

PRESENT AVAILABILITY

DorrClones are now available singly or in multiple arrangements in four standard sizes: 3″, 6″, 12″ and 24″ diameters.

APPLICATIONS

Standard units are now limited to separations in the 20 micron to 100 mesh range but present studies indicate broader applications in the future. Typical commercial applications proven to date are:

Degritting of viscous suspensions such as milk of lime and clay slurries.

Desliming of metallurgical pulps, phosphate rock, coal, iron ore and tailings for mine backfill, with the production of extremely dense underflows where such are desired.

Classification of crystalline and other granular suspensions.

PATENTS

The DorrClone is covered by patents issued and pending in the United States and other countries.

Further information... We welcome inquiries on specific problems and applications and are prepared to undertake engineering investigations within the scope of our present knowledge and experience.

*DorrClone is a Trademark of The Dorr Company

DORR

RESEARCH ENGINEERING EQUIPMENT

DORRCO

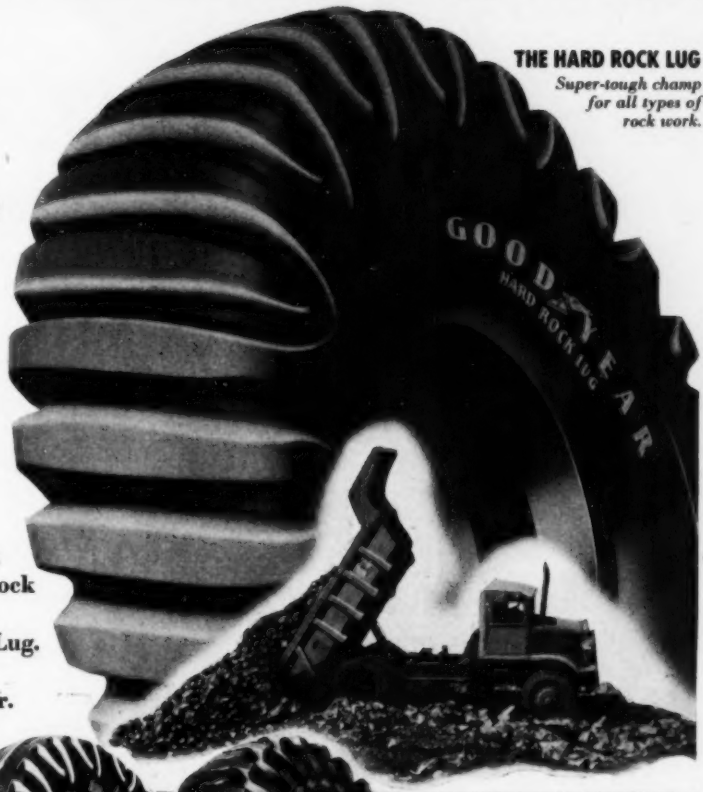
THE DORR COMPANY, ENGINEERS
BARRY PLACE, STAMFORD, CONN.
NEW YORK • ATLANTA • TORONTO
CHICAGO • DENVER • LOS ANGELES
RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.
SUGAR PROCESSING
PETREE & DORR DIVISION, STAMFORD, CONN.
ASSOCIATES AND REPRESENTATIVES
Dorr Technical Services and Equipment Are Also Available Through Associated Companies and Representatives in the Principal Cities of the World. Names and Addresses on Request.

TOUGH in tread
TOUGH in body
for the TOUGHEST jobs you have!

THAT'S Goodyear's Hard Rock Lug Tire. Extra-thick undertread protects its extra-tough carcass against bruising—extra-heavy tread and sidewalls are armored against cuts and rips by massive lug bars—self-cleaning tread provides outstanding traction.

With all these *extras* built into it, no wonder quarry operators say Goodyear's Hard Rock Lug has no equal for cutting costs on tire-killing rock work!

If you'd like to cut *your* rock hauling costs right down to rock bottom, ask your Goodyear dealer about the Hard Rock Lug. You'll see why *it pays* always to BUY and SPECIFY Goodyear.



THE HARD ROCK LUG
Super-tough champ for all types of rock work.

THE HARD ROCK RIB
Companion tire for front wheels in rock work—easier steering, smooth rolling, same cord body, same shoulder and sidewall as Hard Rock Lug.

THE ROAD LUG
Remarkable dual-purpose tire operates both OFF and ON the road. Combines off-the-road toughness and traction with on-the-road mileage and economy.

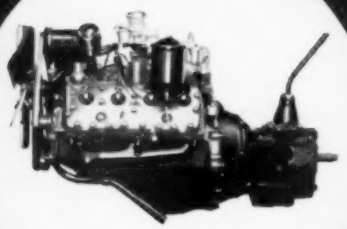
Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND

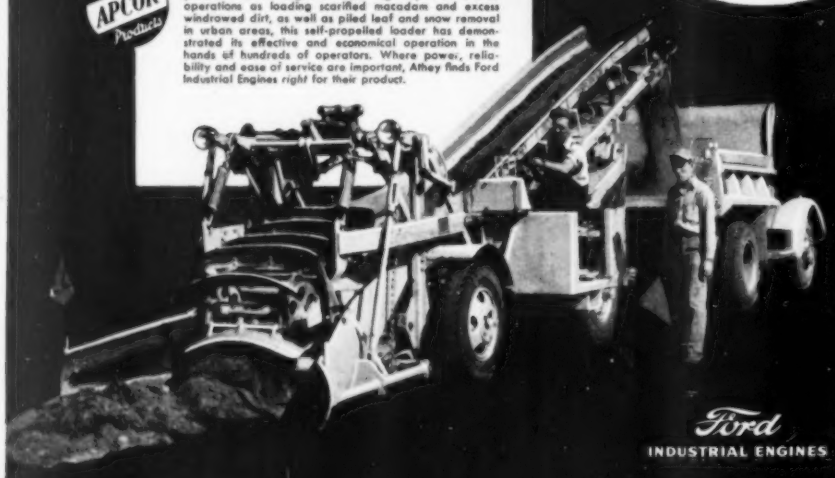
3



Ford 239 V-8 Industrial Engine, with four-speed transmission. (Displacement—239 cu. in.)

Athey APCOR Products

A Ford Industrial Engine is the power plant for the Athey Force-Feed Loader, made by the Athey Products Corporation of Chicago. In such highway maintenance operations as loading scarified macadam and excess windrowed dirt, as well as piled leaf and snow removal in urban areas, this self-propelled loader has demonstrated its effective and economical operation in the hands of hundreds of operators. Where power, reliability and ease of service are important, Athey finds Ford Industrial Engines *right* for their product.

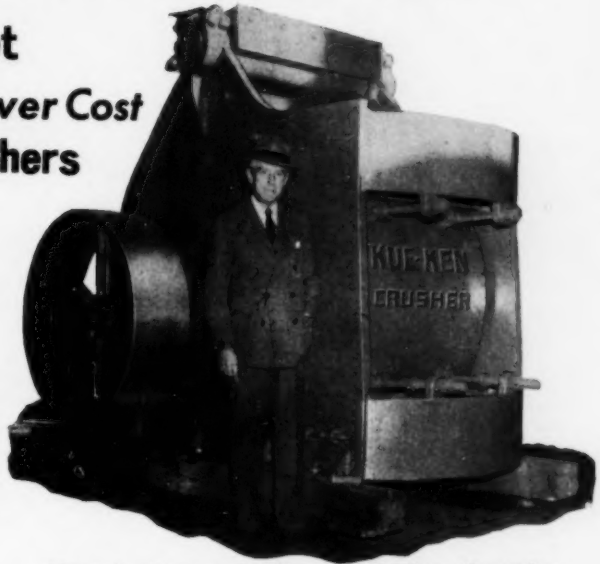


Ford
INDUSTRIAL ENGINES

Kue-Ken* Crushers Give 5-10 Times Longer Jaw Plate Life With More Volume on Less Power

These Users Get More Production at *Lower Cost* with Kue-Ken Crushers

You Too Can Profit with Kue-Ken's Proven Principle of "Crushing Without Rubbing"



Above is shown a #42" x 27" Kue-Ken. Capacity 250-350 tons per hour. *Only* 60 H.P. required. Weighs 30,495 lbs.

22 Sizes 12" x 7" to 48" x 60"

Get Complete Facts — Write for Bulletins

YOUR NEAREST WESTERN DEALER

California (Southern)—Migula & Co. ..... Pasadena
Montana—Caird Engineering Works ..... Helena
Texas—Engineered Sales Co. ..... San Antonio
Utah—Lund Machinery Co. ..... Salt Lake City

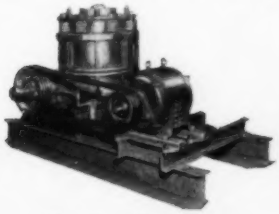
Licensed mfgr. for Eastern U. S., Canada and Puerto Rico: Pennsylvania Crusher Co., Broad and Arch Sts., Phila., Pa.

MAIL COUPON TODAY

COMPANY A has used a Kue-Ken crusher for over 11 years, 8 hours a day crushing limestone, and is still using the original jaw plates. This same company recently purchased another Kue-Ken crusher for a new plant.

COMPANY B used an overhead eccentric type crusher which required new jaw plates every three months. This was replaced by a Kue-Ken crusher which crushes finer with less power and jaw plates last 32 months.

COMPANY C gets 12 months per set of jaw plates compared to two months with an overhead eccentric type. The Kue-Ken, which is 10-in. by 24-in., produces as much as their overhead eccentric crusher, which was 10-in. by 36-in. This overhead eccentric got so hot at times that it actually caught fire.



Kue-Ken Gyracone

Overstrom Screens

*Pronounced Que-Ken. U.S. and Foreign Patents Pending.

Straub Mfg. Company
546 Chestnut Street, Oakland 20, California

• Please send your free bulletin on

JAW CRUSHERS ☐
GYRACONE CRUSHERS ☐

Name .....
Company .....
Address .....
City ..... State .....

546 CHESTNUT ST. • OAKLAND 20, CALIFORNIA

STRAUB MFG. CO.

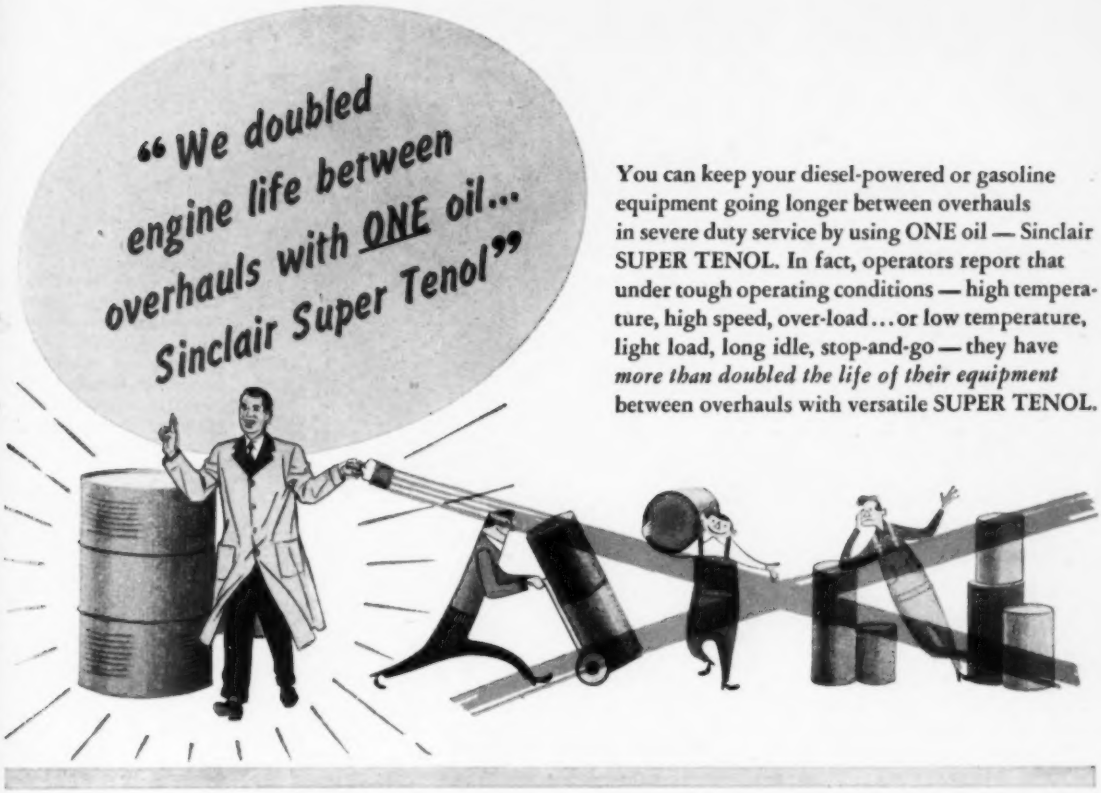
Kue-Ken Balanced Crushers	Rib Cone Ball Mills	Overflow Classifiers
Kue-Ken Simplex Crushers	Concentrating Tables	Feeders
Kue-Ken Gyratory Crushers	Overhead Eccentric Crushers	Screenwheel Classifiers

"Change DOWNTIME into WORK TIME with this ONE OIL and ONE GREASE"

"We speeded and improved lubrication with ONE grease... Sinclair Litholine"

SINCLAIR

Pit and Quarry



You can keep your diesel-powered or gasoline equipment going longer between overhauls in severe duty service by using ONE oil — Sinclair SUPER TENOL. In fact, operators report that under tough operating conditions — high temperature, high speed, over-load... or low temperature, light load, long idle, stop-and-go — they have *more than doubled the life of their equipment* between overhauls with versatile SUPER TENOL.

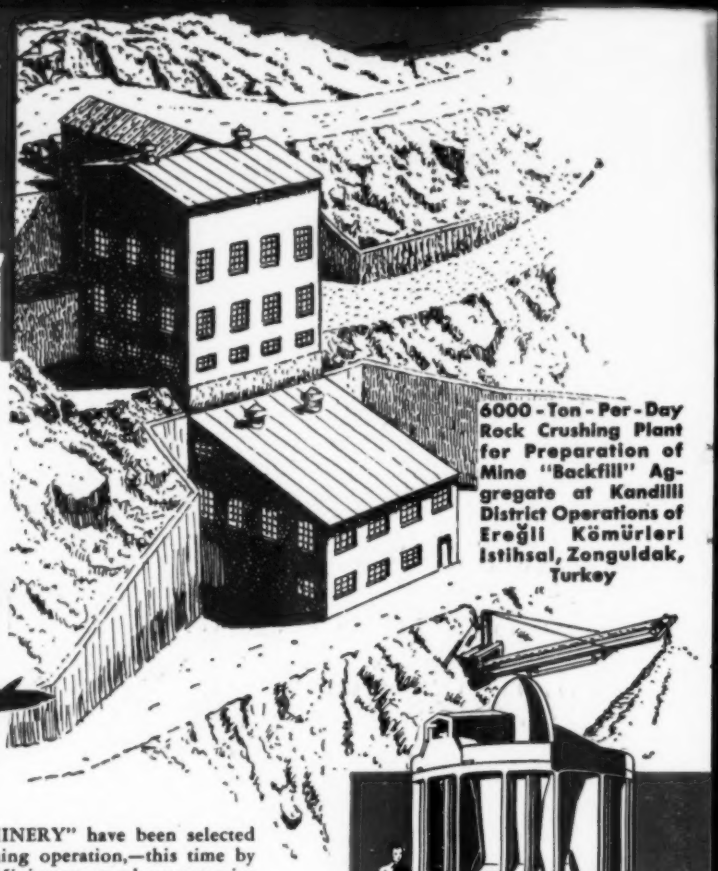
Consider how you can cut downtime and grease inventories by using ONE single grease for the complete lubrication job. Sinclair Litholine provides better lubrication than long-established specialized greases. And that means for *all* lubrication points — chassis, wheel bearings, water pumps, universal joints — in winter or summer, under all kinds of operating conditions. Litholine gives you —

1. Superior protective lubrication at *every* point.
2. No danger of costly misapplication.
3. Quicker servicing, less downtime.
4. Smaller grease inventories. One grease instead of from three to four.
5. Fewer dispensing units.
6. Less chance for contamination.
7. Simplified purchasing and distribution.
8. Less wastage.

Sinclair will gladly send you a folder describing demonstrations showing the superiority of Litholine over other greases.

SUPER TENOL AND LITHOLINE

Another prominent group selects NORDBERG *throughout*



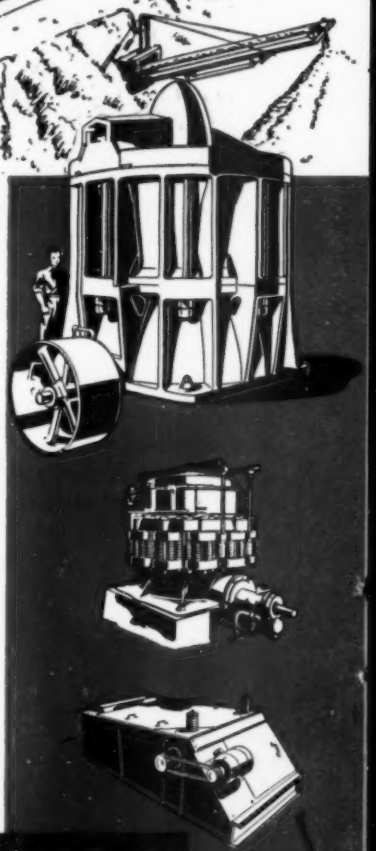
6000-Ton-Per-Day Rock Crushing Plant for Preparation of Mine "Backfill" Aggregate at Kandilli District Operations of Ereğli Kömürleri Istihsal, Zonguldak, Turkey

NORDBERG "KNOW-HOW and MACHINERY" have been selected again for an essential and important crushing operation,—this time by E. K. I., of TURKEY, the predominant Coal Mining group whose extensive workings in the Zonguldak Coal Basin on the North Coast of Turkey, overlooking the Black Sea, are being modernized and improved through a vast mechanization and electrification program to double the annual coal output of the country.

An unusual feature of this undertaking is the plant which is being provided to reduce the hazard of spontaneous combustion and dreaded black damp,—through hydraulic backfilling of the spent workings.

To assure an adequate and steady flow of "backfill" aggregate, a completely NORDBERG-equipped plant to produce 6,000 tons per day of "finely crushed hard rock" is being installed. This involves PRIMARY and SECONDARY CRUSHERS, SCREENING UNITS, a well designed materials handling system with provision for surge and feed control, and adequate facilities for servicing and maintenance of equipment. The basic Crushing Plant units include a *30" Nordberg Heavy Duty Primary Gyratory Crusher, two 4¼' Symons Cone Crushers, and two 5'x8' Symons Rod Deck Vibrating Screens.*

For large or small operations,—whether such be mineral reduction, base or precious metals, public works projects, or commercial aggregate production—you can depend on NORDBERG EQUIPMENT to deliver maximum output at lowest possible cost.



NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN

NEW YORK • SAN FRANCISCO • WASHINGTON • SPOKANE
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M306

NORDBERG *Machinery for processing ores and industrial minerals*

Primary Crushers

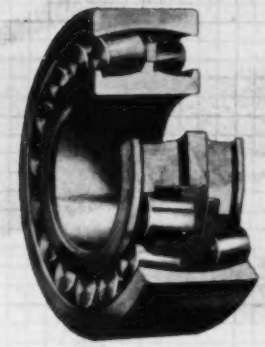
Vibrating Bar Grizzly

Symons Rod Deck Screen

Grinding Mills

Mine Hoist

Diesel Engines



...help screen stone for profit

Screen Equipment Company SECO vibrating screens are built to deliver large tonnage output with minimum maintenance through the use of Torrington Spherical Roller Bearings.

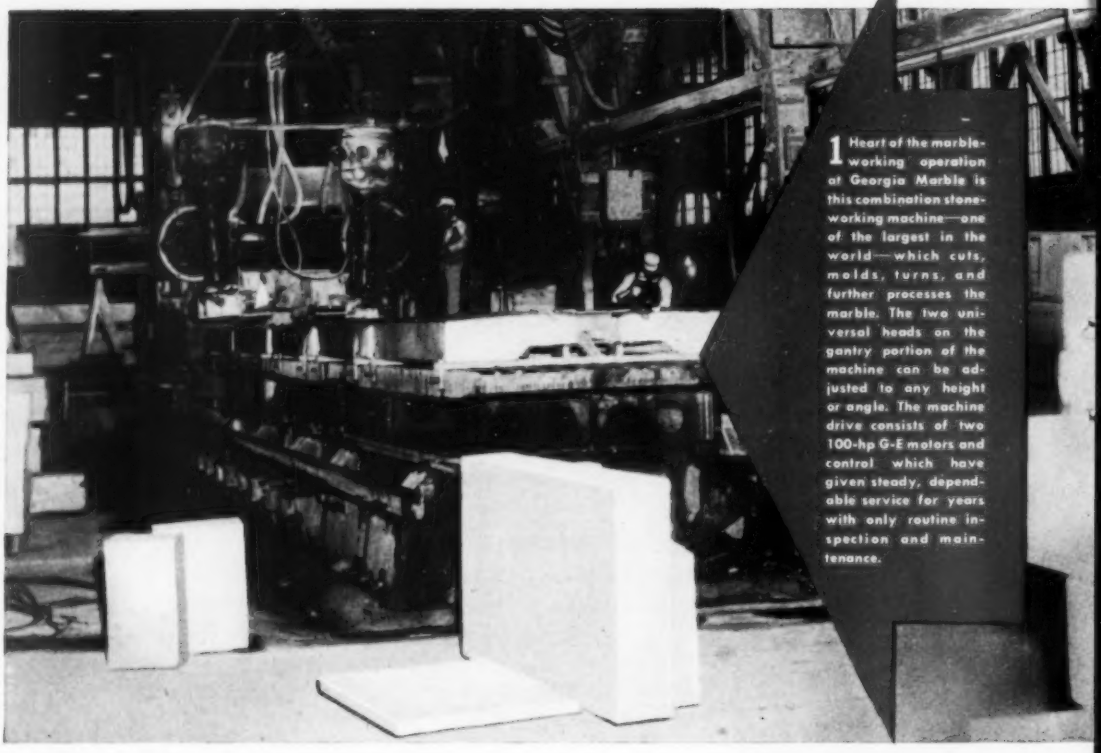
These self-aligning bearings automatically compensate for shaft deflection, require no alignment adjustments in service, and provide the high capacity needed to handle heavy gyratory loads.

Torrington Spherical Roller Bearings can assist in securing profitable operation of your heavy-duty equipment. Let our engineers help you work out details of design and application.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON *SPHERICAL ROLLER* **BEARINGS**

SPHERICAL ROLLER • TAPERED ROLLER • STRAIGHT ROLLER • NEEDLE • BALL • NEEDLE ROLLERS



1 Heart of the marble-working operation at Georgia Marble is this combination stone-working machine—one of the largest in the world—which cuts, molds, turns, and further processes the marble. The two universal heads on the gantry portion of the machine can be adjusted to any height or angle. The machine drive consists of two 100-hp G-E motors and control which have given steady, dependable service for years with only routine inspection and maintenance.

2. At the quarry, where blocks of marble are hoisted onto flat cars for shipment to the plant, this 50-hp, G-E Tri-Clad* motor, with its G-E control shown at left, powers the 20-ton quarry hoist. Tri-Clad motors are noted for their built-in 3-way extra protection against physical damage, electrical breakdown, and operating wear.

*Reg. Trade-mark of General Electric Co.

3. This 65-ton G-E diesel-electric switching locomotive, shown hauling marble blocks to the plant over the company's 14 miles of rail road, has been in service since April 1946. According to T. J. Durrett, Jr., vice-president, "it has provided excellent service, considerable saving in track maintenance, and substantial fuel economies."

4. After going through gang saws operated by a 40-hp G-E motor, the marble slabs are smoothed down on two rubbing-beds (one shown), both powered by the 60-hp G-E motor in upper left. The plant's G-E motors and control have helped maintain a high degree of production continuity.

You can put your confidence in—

GENERAL ELECTRIC

658-4

ELECTRIFICATION WITH G-E DRIVES BOOSTS PLANT'S OUTPUT!

G-E motors and control, plus G-E diesel-electric switching locomotive, increase efficiency and savings at Georgia Marble Company

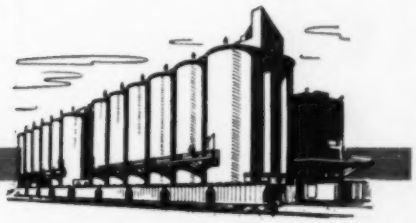
In marble-working—as in all rock product industries—electrification pays off handsomely when you use General Electric equipment. Take it from T. J. Durrett, Jr., vice-president of the Georgia Marble Co., of Tate, Georgia, who says:

"Electrification in our plant over the years has considerably improved operations, helping to raise production and reduce costs. In this respect our G-E equipment, in particular, has more than justified its cost."

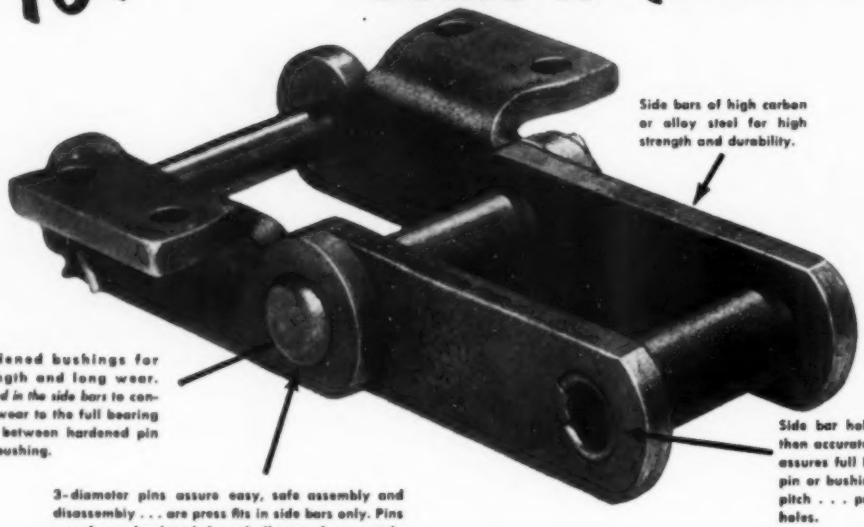
Here's the point: Whatever you get from General Electric, whether a drive for one process or all your plant's electric equipment, it's coordinated into a smooth-working installation by a G-E industry engineer. Call him in early and see how his advice can help you speed output, cut costs. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

5. Providing stabilization of voltage at Georgia Marble Co. plant is this G-E 3000 KVA synchronous condenser which improves power factor throughout varying load conditions inherent in rock products industry. Another method for improving plant power factor is the use of efficient, trouble-free synchronous motor drives where applicable.

Everything you need
to cut rock product costs
. . . electrically!



"TOPS" WHEN THE GOING IS TOUGH!


Side bars of high carbon or alloy steel for high strength and durability.
Hardened bushings for strength and long wear. *Locked in the side bars* to confine wear to the full bearing area between hardened pin and bushing.
Side bar holes are pierced, then accurately shaved. This assures full bearing area on pin or bushing . . . accurate pitch . . . precisely parallel holes.
3-diameter pins assure easy, safe assembly and disassembly . . . are press fits in side bars only. Pins are of case-hardened, forged alloy steel, accurately milled to provide proper clearance between pin and barrel. *Pins are locked* against rotation in side bar.

other Rex equipment that's built to last

Rex Lay Bushed Chains
For general elevator service under severe abrasive conditions.

Rex Combination Chains
For general elevator service where speeds and loads are moderate.

Rex Style "A" Bucket
For general service

Rex Style "AA" Bucket
For heavier, more abrasive material.

Rex Tomporim Sprocket
For extra long sprocket life.

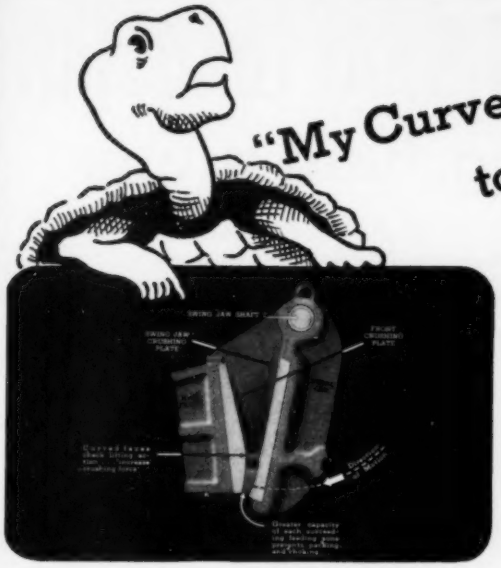
Rex Chabelco all heat-treated steel elevator chains are the ultimate where service is rough and tough! There is good reason why these all steel elevator chains last longer . . . handle more tonnage per chain dollar. It's the accurate pitch that means smooth sprocket action . . . the precision-built, heat-treated parts pressed together to stay that make **Rex Chabelco** outstanding for severe bucket elevator service.

The pins, bushings and side bars are firmly fixed. They just can't come loose, begin to wobble and cause unnecessary chain wear. Compare the "fit" of **Rex Chabelco** parts with that of any other similar chain. You'll notice at once the accurate, snug assembly that makes **Chabelco** the leader.

These *all steel* chains cost only slightly more than malleable iron chains. Get more information on how they can make your bucket elevator dollars go further. Write to **CHAIN BELT COMPANY, 1604 West Bruce Street, Milwaukee 4, Wisconsin.**

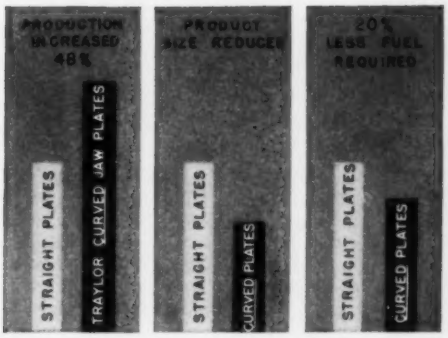
CHAIN BELT
REX
COMPANY

DRIVE AND CONVEYOR CHAINS

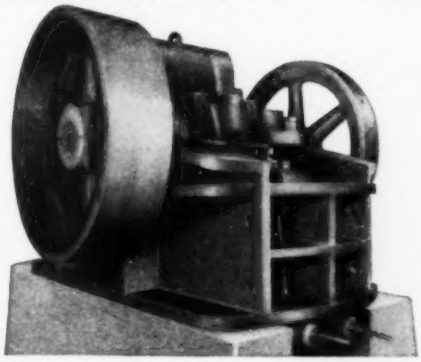


"My Curved Jaws Make it Easier to Crush More...Finer"

Traylor applied this principle of nature to jaw crushers and developed the most efficient jaw plates made. Their engineered curves exert all of the power applied as crushing force . . . lifting action is eliminated. The increased size of each succeeding feeding zone prevents choking.



An actual, recorded instance is illustrated by this graph. Each white bar indicates the performance of a certain jaw crusher with its original straight plates. The black bars show how Traylor Curved Jaw Plates fitted to the same crusher produced *greater tonnage* of *finer product* with *less fuel.*



The Traylor Type HB Jaw Crusher has Traylor *Curved* Jaw Plates as standard equipment. Long, efficient operation is assured by such features as an improved bulldog pitman, three bearing toggle system and manganese steel, reversible cheek plates. Main bearings are babbitted, water jacketed and fitted with generous grease reservoirs.

The new, illustrated Bulletin 3105 fully describes the Traylor Type HB and Type H Jaw Crushers and their *Curved* Jaw Plates. Write today for your copy or for information about fitting your present equipment with Traylor *Curved* Jaw Plates.

TRAYLOR ENGINEERING & MANUFACTURING CO.
217 Mill St., Allentown, Pa.

Sales Offices: New York, N. Y., Chicago, Ill., Los Angeles, Calif.
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

Traylor

Rotary Kilns, Coolers and Dryers
Grinding Mills . . Crushing Rolls
Jaw, Reduction and Gyratory Crushers

A "TRAYLOR" LEADS TO GREATER PROFITS

THE NEW INTERNATIONAL LOADSTAR

is built for a long, hard future

Model for model, Loadstars are the most rugged of all the rugged trucks in the International L-Line.

There's a special reason why this is so. Right from the drawing board stage, Loadstar models are specialized for work on assignments that give trucks a real beating.

You get a truck built for rough work

It's no wonder Loadstars thrive on hard knocks. Inverted "L" type frame reinforcements, heavier rear springs, and oversize rear axles are among the "geared for punishment" features that make them more than a match for the toughest jobs. Here is heavy-duty engineered ruggedness at its rugged best.

You get extra savings

Just wait till you find out how much lower operating and maintenance costs can be when you have a Loadstar. You get the kind of savings that have kept Internationals first in heavy-duty truck sales for 18 straight years.

You get new ease of handling

You get in and out of tight spots with ease. Shorter wheelbases, new wider-tread axles, and steering improvements galore assure you easy turns in the shortest practical circles.

You get a cab-full of comfort!

Tough jobs aren't quite as tough for the man behind the wheel of a Loadstar. He rides in the Comfo-Vision Cab—"roomiest on the road" . . . gets full front visibility through a one-piece, curved Sweepsight windshield . . . enjoys more positive control from a more comfortable position.

There's a Loadstar model just right for your job

Get complete information from your nearest International Truck Dealer or Branch.

International Harvester Builds
McCormick Farm Equipment and Farmall Tractors
Motor Trucks . . . Industrial Power
Refrigerators and Freezers

Heavy-Duty Engineered

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY CHICAGO

CLEARING HIGHWAYS WITHOUT STOPPING TRAFFIC

Eimco crawler mounted RockerShovels make ideal tools for clearing slides off highways without interrupting traffic.

Eimcos are built for heavy-duty operation, for digging and loading rock. They're fast — 3 to 5 yards of rock per minute and they're dependable.

Every contractor who has purchased a crawler mounted RockerShovel has been so pleased he's reordered in less than 6 months — some, three or four times.

Write for bulletin.

A-279

ROOM TO PASS WHILE LOADING WITH EIMCO 104 ON NARROW HIGHWAY

EIMCO

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 8, UTAH, U. S. A.

BRANCH SALES AND SERVICE OFFICES:

NEW YORK, 51-52 SOUTH STREET • CHICAGO, 3319 SOUTH WALLACE STREET
BIRMINGHAM, ALA., 3140 FAYETTE AVE. • DULUTH, MINN., 216 E. SUPERIOR ST.
EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIFORNIA, P. O. BOX 240
KELLOGG, IDAHO, 315 MAPLE STREET

AFFILIATED COMPANIES: SOCIETE EIMCO, PARIS, FRANCE
EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
AGENTS IN ALL PRINCIPAL CITIES THROUGHOUT THE WORLD

For Rock Bottom Costs From Start to Finish!

START . . . FLUXING STONE
A P&H Model 1400 Diesel-Electric (4 yd.) shovel, owned by Drummond Dolomite Inc. at Drummond Island, Michigan.

FINISH . . . BLAST FURNACE SLAG
A P&H Model 1400 Diesel-Electric shovel owned by the Buffalo Slag Co., Buffalo, New York.

P&H DIESEL-ELECTRIC SHOVELS

with *MAGNETORQUE** HOIST DRIVE

Now, you can have electric shovel efficiency *anywhere* with a P&H Diesel-Electric quarry and mining shovel. It's a complete electric shovel . . . with the addition of a diesel engine to furnish power . . . entirely independent of high line service.

Years of the toughest rock digging have proved the P&H Diesel-Electric from every standpoint . . . dependable operation . . . less maintenance . . . rock bottom tonnage costs.

This simplified P&H Diesel-Electric shovel is made possible by the exclusive P&H Magnetorque Hoist Drive. Hoist generator, hoist motor, slip friction clutch and other mechanical devices are completely eliminated. Magnetorque is only one of many P&H Added Values. Ask for Bulletin X83-DE.

Every Third P&H Electric Shovel Sold is a Repeat Order.

P&H **ELECTRIC SHOVELS**
4451 West National Avenue
Milwaukee 14, Wis.

HARNISCHFEGER CORPORATION

*Trade-Mark of Harnischfeger Corporation for electro-magnetic type clutch

IT COSTS LESS TO OWN THE BEST!

THE NEW KENNEDY "STRATIFIED"

AIR SWEPT TUBE MILL SYSTEM

EFFICIENCY RIGHT OUT WHERE YOU CAN SEE IT!

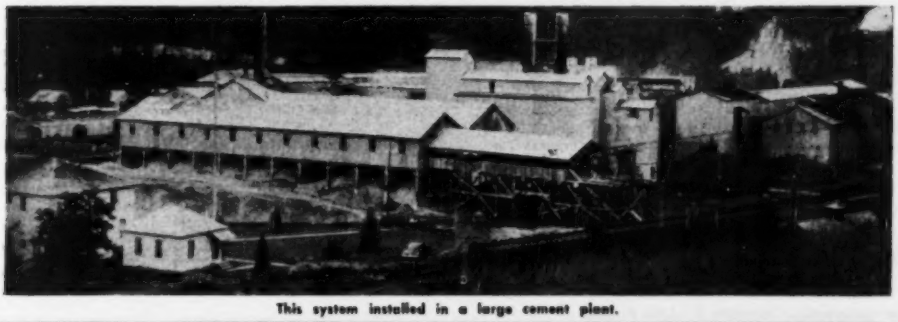
SEE INSIDE

A "STRATIFIED" AIR SWEPT TUBE MILL that provides continuous, rapid, smooth-flowing action. Gets production costs right down to rock bottom . . . steps up capacities . . . improves quality . . . INCREASES PROFITS.

DESIGNED BY KVS ENGINEERS, built completely by KVS master craftsmen to perform each coordinated operation with utmost efficiency. An entirely NEW conception in the processing of stone, ore and clinker.

EVERY STEP, from the loading of raw materials to the storage of the finished product, is automatic—fool-proof and trouble-free. Every operation follows in logical sequence, synchronized with each succeeding phase. As a result, important economies are effected in power consumption, labor costs reduced, the entire operation simplified.

DAY-IN, DAY-OUT, this system is proving its worth by doing the kind of a rugged, satisfactory job that critical users have a right to expect of it. It's TOP KVS quality . . . the BEST in engineering and manufacturing. Blue prints and operating data sent on request.



This system installed in a large cement plant.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

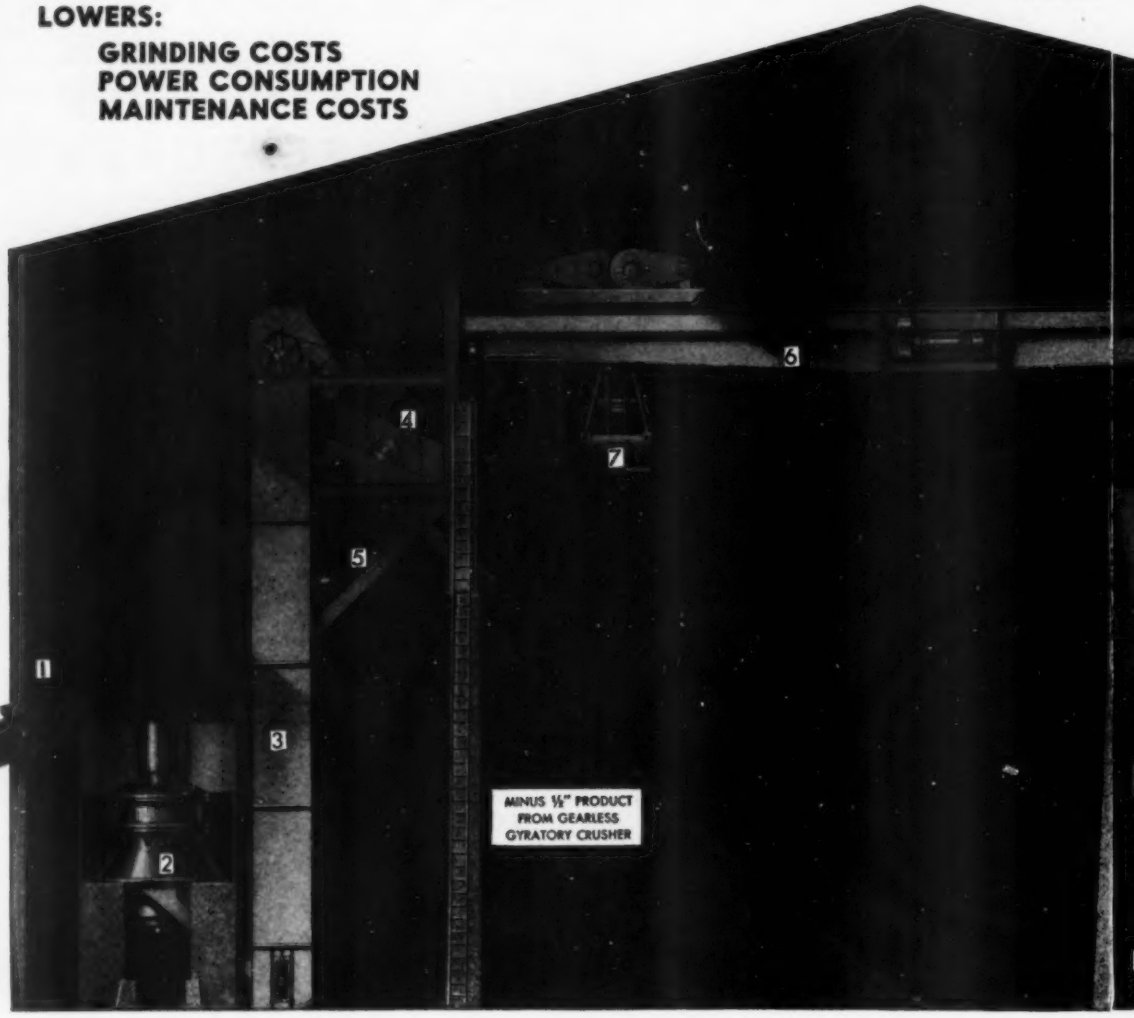
KENNEDY STRATIFIED AIR

FOR RAW STONE, ORE

(Patents

LOWERS:

GRINDING COSTS
POWER CONSUMPTION
MAINTENANCE COSTS



1 BELT CONVEYOR — FEED TO CRUSHER
2 GEARLESS GYRATORY CRUSHER
3 ELEVATOR
4 VIBRATING SCREEN
5 OVERSIZE RETURN CHUTE
6 TRAVELING CRANE
7 CLAMSHELL BUCKET
8 MILL FEED HOPPER
9 WEIGHING FEEDER
10 STRATIFIED AIR SWEPT TUBE MILL
11 RADIAL FLOW CLASSIFIER

THIS UNIT PRODUCED 94% PLUS THROUGH 325

Ask for One of Our

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

SWEPT TUBE MILL SYSTEM

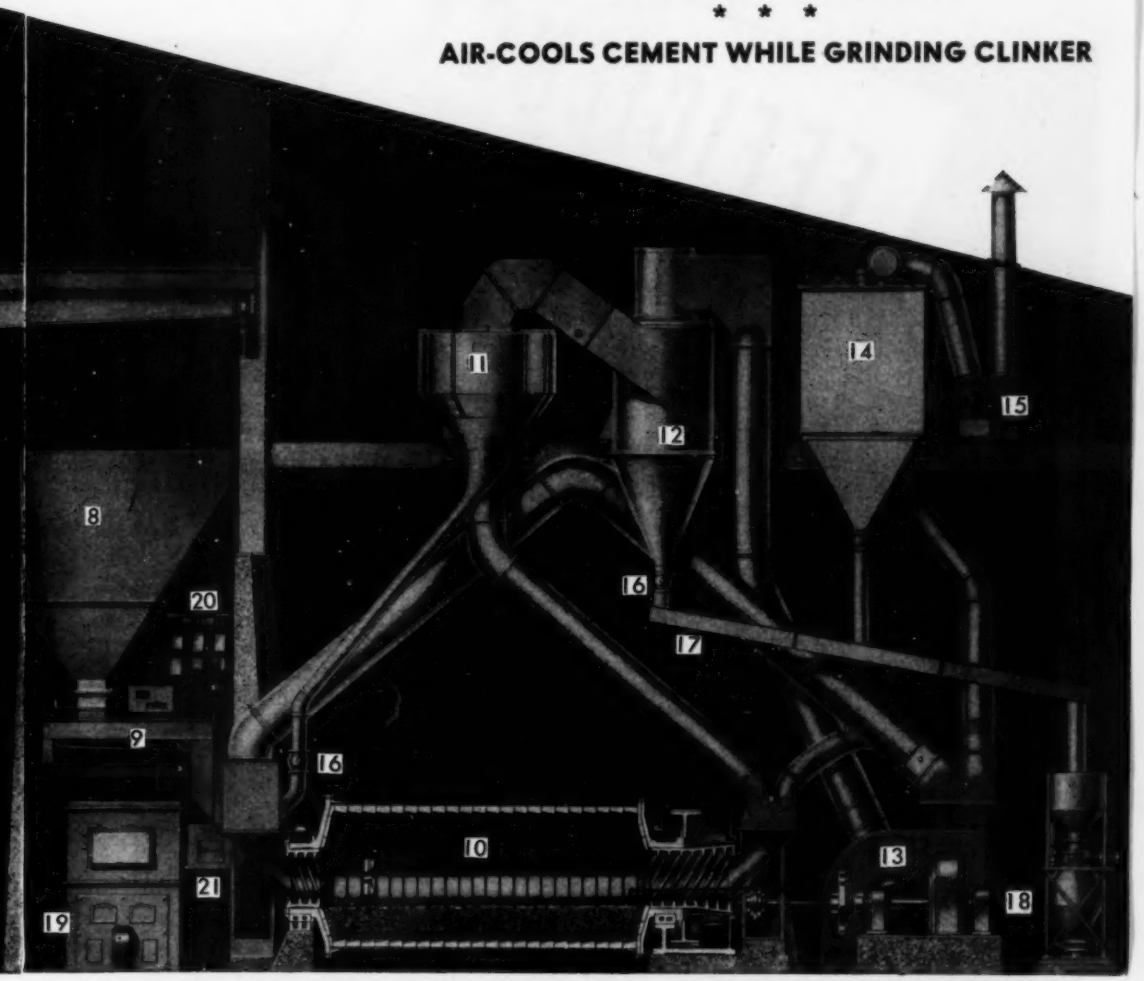
AND CLINKER GRINDING

Pending)

DRIES AND GRINDS SIMULTANEOUSLY

* * *

AIR-COOLS CEMENT WHILE GRINDING CLINKER



12	CYCLONE COLLECTOR	17	FINISHED MATERIAL CONVEYOR
13	MILL EXHAUSTER	18	AUTOMATIC PNEUMATIC TRANSPORT PUMP
14	DUST FILTER	19	HOT AIR FURNACE
15	DUST FILTER EXHAUSTER	20	INSTRUMENT AND CONTROL CUBICLE
16	ROTARY AIR LOCKS	21	AUTOMATICALLY CONTROLLED TEMPERING AIR DAMPER

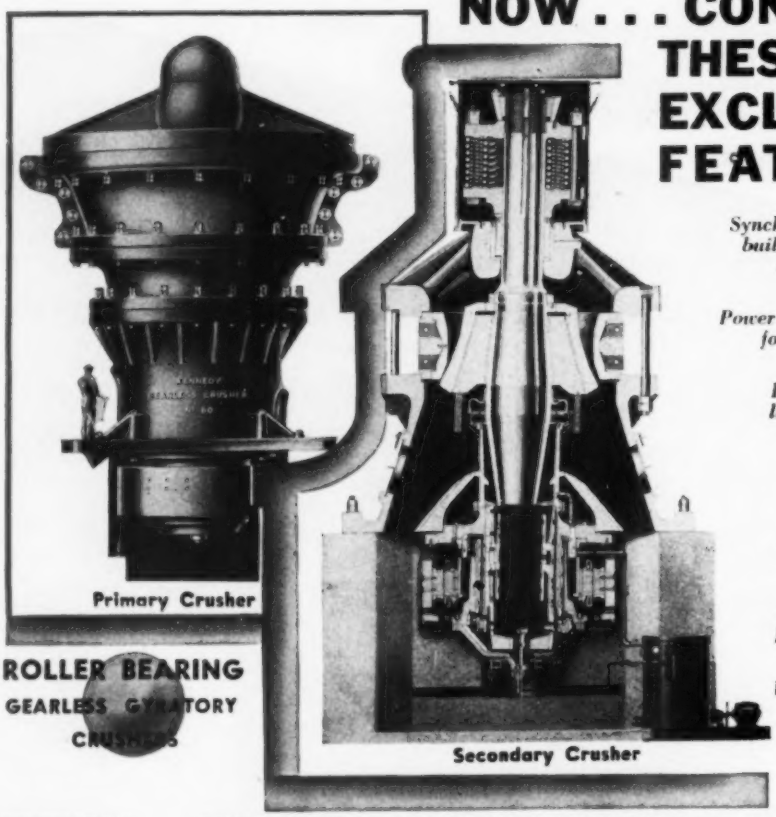
FINISHED MATERIAL TO STORAGE SILO

MESH WHEN GRINDING CLINKER 2" AND FINER.

Engineers to Call

IT COSTS LESS TO OWN THE BEST!

NOW . . . CONSIDER THESE KVS EXCLUSIVE FEATURES



SEE INSIDE

ROLLER BEARING
GEARLESS GYRATORY
CRUSHERS

- *Synchronous motor built into pulley assembly*
- *Power applied ONLY for crushing*
- *Force-feed lubrication*
- *No gears to waste power*
- *Added power at no added cost*
- *Quiet — smooth Frictionless action*
- *Varying capacities to serve every purpose*

CRUSHERS . . . BUILT WITH THE RUGGED STAMINA OF A HEAVY TANK

KVS GYRATORY CRUSHERS are designed and built to give years of satisfactory service, even under severe operating conditions. This important fact is being proved, year-after-year, in numerous crushing plants throughout the world.

THE ENGINEERING PRINCIPLES which make them such outstanding machines, are backed by manufacturing skill and the use of steel and other materials that cannot be excelled. In addition to dependable operation, their rugged stamina holds repair costs to a minimum and maintains production schedules.

IT'S THIS KIND OF A UNIFORM PERFORMANCE record that sets KVS crushers apart and explains WHY users agree that "It Costs Less To Own The Best." If you are interested in a proved method of increasing both production and profits, let a KVS engineer study your problem and suggest his plan.

BLUE PRINTS AND OPERATING DATA ON KVS CRUSHERS AVAILABLE ON REQUEST.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

Why dig deep to pay hauling costs?

DODGE trucks are "Job-Rated" to cut costs!

Yes, you can cut your hauling costs plenty with trucks that fit your job—Dodge "*Job-Rated*" trucks!

Your Dodge trucks will have engines that are "*Job-Rated*" to give you power to spare with top-notch economy. You'll save on gas, oil—and upkeep, too!

And remember, "It's a long haul between overhauls with Dodge '*Job-Rated*' trucks!" You'll enjoy their long life of dependable performance on your toughest pit or quarry jobs.

Take a look at the other Dodge truck advantages listed below. Then . . . for a good deal . . . see your Dodge dealer today!

"Job-Rated" . . . for low-cost transportation

POWER: . . . 8 great truck engines—each "*Job-Rated*" for *PLUS* power.

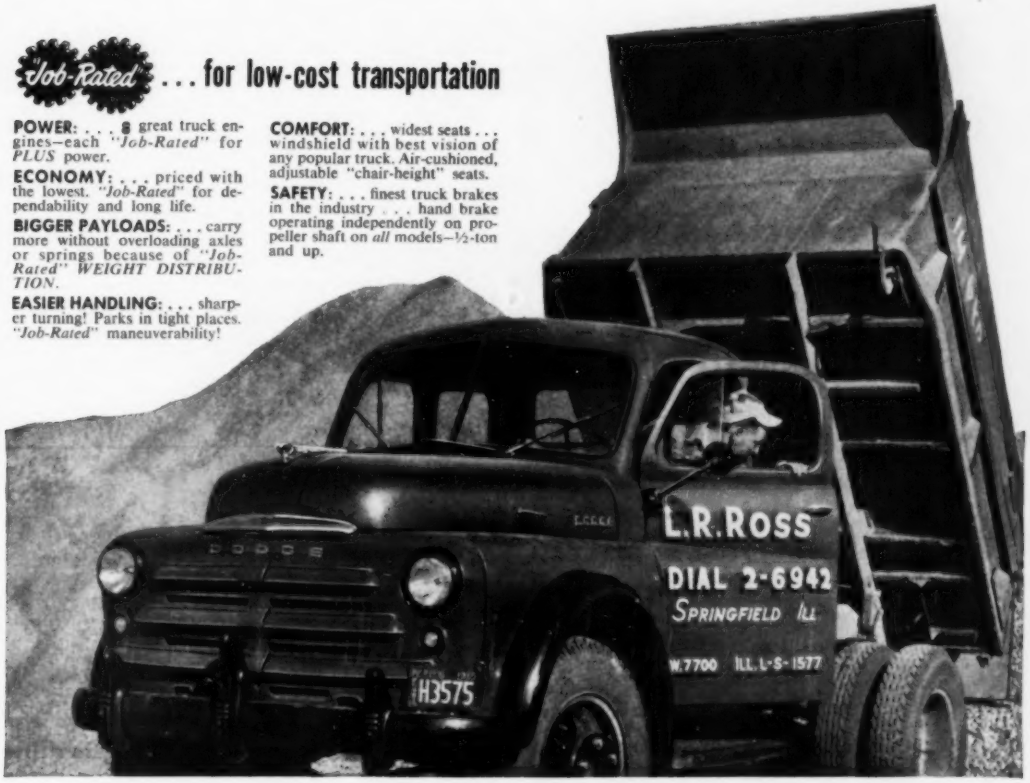
ECONOMY: . . . priced with the lowest. "*Job-Rated*" for dependability and long life.

BIGGER PAYLOADS: . . . carry more without overloading axles or springs because of "*Job-Rated*" *WEIGHT DISTRIBUTION*.

EASIER HANDLING: . . . sharper turning! Parks in tight places. "*Job-Rated*" maneuverability!

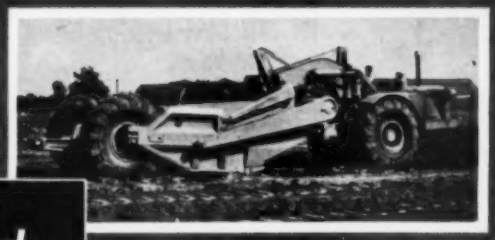
COMFORT: . . . widest seats . . . windshield with best vision of any popular truck. Air-cushioned, adjustable "chair-height" seats.

SAFETY: . . . finest truck brakes in the industry . . . hand brake operating independently on propeller shaft on *all* models—½-ton and up.



With all their extra value **DODGE "Job-Rated" TRUCKS** are priced with the lowest

2 giant new "Caterpillar" Earthmovers



. . . built to outspeed, outwork and outlast all comers!

With their high speeds and huge capacities, these two new "Caterpillar" Earthmovers have what it takes to step up your pace of stripping and hauling overburden. And you know how important pushing work through ahead of schedule is these days, with peak production vital to national defense.

Both these giants are powered by the new 225-HP., 6-cylinder "Cat" Diesel Engine. The 4-wheel DW20, with top speed of 26.6 m.p.h., is available with three matched units: the W20 Wagon, the No. 20 Scraper and the No. 20S 'Dozer. The 2-wheel DW21 has a top speed of 20 m.p.h. and trails the No. 21 Scraper. Features are described on the opposite page.

Here are typical reports on the DW20-W20 unit (25 cu. yds. heaped capacity): "You can run away from other rigs with it," says Operator Robert England. "The dump control is handy and easy to operate. It's got good brakes—you can stop it still, loaded. It's safe on turns and grades. It shifts easy and fast. The engine's got guts." Dragline Operator R. D. Johnson adds: "It's good and wide—you don't waste a bucket. It gets in and out faster than any I ever loaded."

THE DW20 TRACTOR AND W20 WAGON UNIT

This big-capacity unit offers:

17 cu. yds. capacity, struck; 25 cu. yds., heaped.

Travel speeds, through five gear ratios, from 2.88 to 26.6 m.p.h.

Wide-mouthed hopper to provide easy-to-hit target for shovel or dragline loading.

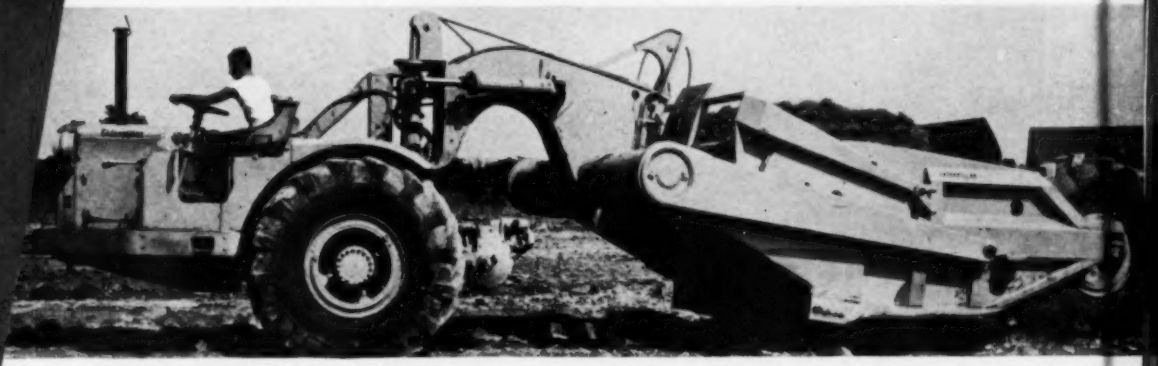
Controlled dumping — openings can be varied without mechanical adjustment — permitting either dumping or windrowing.

Accurate hydraulically controlled dumping with positive mechanical lock on dump doors.

The DW20 Tractor with No. 20 Scraper offers:

The same capacities, speeds and general specifications (except in type of gooseneck) as the No. 21 Scraper.

The DW20 Tractor is also available with the No. 20S Bulldozer.



THE DW21 TRACTOR AND NO. 21 SCRAPER UNIT

This big-capacity unit offers:

Full 90° turn each way—non-stop turn in 35 ft.

15 cu. yds. capacity, struck; 19½ cu. yds., heaped. With available 12" extensions: 18 cu. yds., struck; 22½ cu. yds., heaped.

Travel speeds, through five gear ratios, from 2.16 to 20 m.p.h.

Bowl and apron designed to promote "boiling" action of earth through center of load—for full-measure yardage, minimum loading time.

Large low-pressure tires for easy load flotation.

'Dozer-type ejection for positive "kicking out" of sticky material; dependable spring-action ejector return.

Open bowl design for visible loading under shovel or dragline.

Adjustable rear axle to permit level cuts and desired settings.

Double bottom of special alloy steel. Self-sharpening, reversible cutting edge.

High apron lift, low center of gravity.

Built to the exacting standards that characterize all "Caterpillar" equipment, these big yellow earthmovers are production boosters from the word "go!" What's more, your nearby "Caterpillar" dealer is on call for immediate service. For full information about these rigs, see him or write the factory.

•

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

DW20 AND DW21 TRACTOR FEATURES

NEW ENGINE: The completely new 6-cylinder "Cat" Diesel Engine . . . 225 HP. at 1900 r.p.m. available at the flywheel . . . 275 HP. peak capacity at 2000 r.p.m. tested in accordance with A.S.M.E. Power Test Codes.

TRANSMISSION: Constant-mesh transmission and heavy-duty clutch. Special locking device prevents gears from becoming disengaged.

STEERING: Hydraulic booster steering follows the natural "feel-of-the-road" hand guidance. Heavy steel stops keep gooseneck of drawn equipment from jack-knifing.

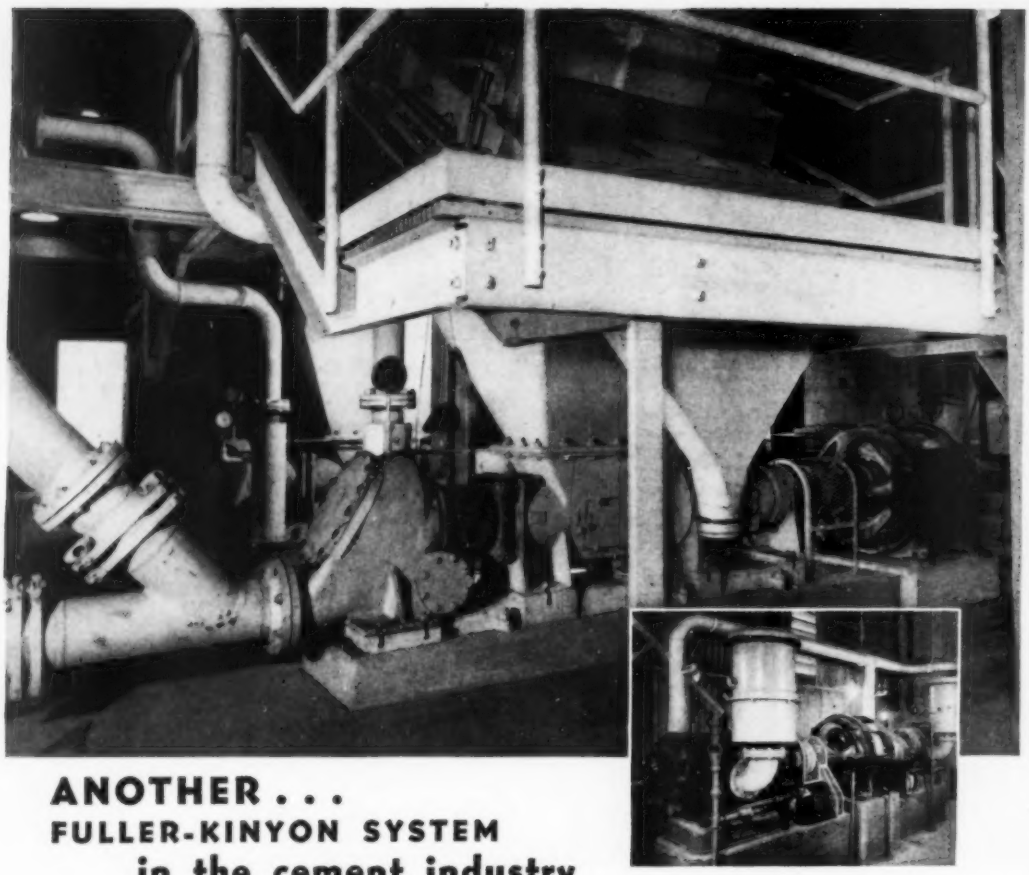
BRAKES: Each large, heavy-duty brake is 22" in diameter, 7" wide. Compressed air energized brakes on both tractor and drawn member of unit. Handy control valves for applying both sets of brakes, and to either right or left driving wheel.

OPERATOR COMFORT: Airfoam rubber cushion on bucket-type seat mounted on coil spring with hydraulic snubber. All controls within easy reach. Excellent visibility.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS
MOTOR GRADERS • EARTHMOVING EQUIPMENT



ANOTHER . . .
FULLER-KINYON SYSTEM
in the cement industry

Following the general practice, of practically all cement plants in this and many other countries, when this mid-western cement company decided to extend its storage and bulk-loading facilities, it again selected the Fuller-Kinyon System as the most efficient and economical conveyor. Two Type L Pumps were installed to convey cement from the finishing mills to three sets of silos . . . maximum conveying distance 1385 feet; capacity of each pump, 376 barrels an hour.

Air for the Conveying System is furnished by two Fuller Rotary Duplex Single-stage Compressors, each of which has a capacity of 2010 c.f.m. at 35 psig.

Cement plants throughout the country have found that the combination of Fuller-Kinyon Pumps and Fuller Rotary Compressors, provide by far the most efficient, trouble-free and economical method of conveying yet developed. Air, at the proper pressures to handle the job at minimum cost and maintenance, is always available where and when it is needed.

To call in a Fuller Engineer to survey your present conveying system places you under no obligation. It may be your long first step toward more efficient and profitable operation.

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS, AND ASSOCIATED EQUIPMENT

fuller

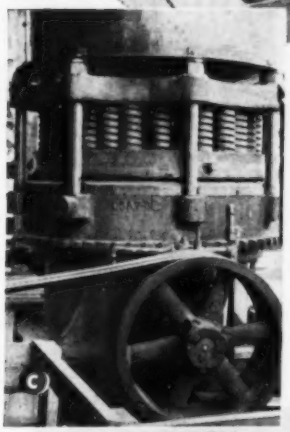
FULLER COMPANY, Catasauqua, Pa.
120 S. LaSalle St., Chicago 3
420 Chancery Bldg., San Francisco 4

P-117

Large Tonnage

of either

FINE or BASE SIZES



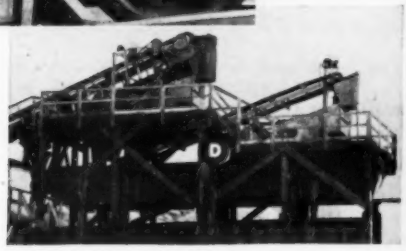
● The LYCOMING SILICA SAND COMPANY'S Lime Bluff Quarry Plant in the Helderberg limestone formation between Muncy and Hughesville in Lycoming Country, Pa., is designed to turn out *big tonnage.*

Although planned to produce about 90-100 tons per hour of minus 1¼" aggregate, this plant regularly hits as high as 125 tons hourly when producing this and smaller sizes.

Look at its Telsmith equipment. You'll see *why* it does.

HIGHLY FLEXIBLE too, this plant can make 8 to 10 finished sizes at the same time, including a large percentage of both fine and coarse sizes. It turns out big tonnage of fine stone for bituminous construction and state highway maintenance, without excessive stock-piling of larger sizes—or it makes base stone, and lots of it, when needed.

Modernizing or building? Let Telsmith Complete Plant Service help you build in bigger tonnage with utmost flexibility. Get Bulletin 266. Q-21R



A Telsmith Hercules Scalper
B Telsmith Heavy Duty Apron Feeder
C Telsmith Fine Crushing Gyrasphere
D Two Telsmith 2-Deck Vibro-King Screens

Telsmith EQUIPMENT used in Lime Bluff Quarry Plant

- 54" x 16' Heavy Duty Apron Feeder
- 24" x 183' Belt Conveyor
- 30" x 175' Belt Conveyor
- Two 3' x 10' 2-Deck Vibro-King
- 60" x 21' Hercules Scalper
- No. 36 Fine Crushing Gyrasphere
- 4' x 12' 2-Deck Pedestal
- No. 48 Standard Gyrasphere
- 24" x 100' Belt Conveyor

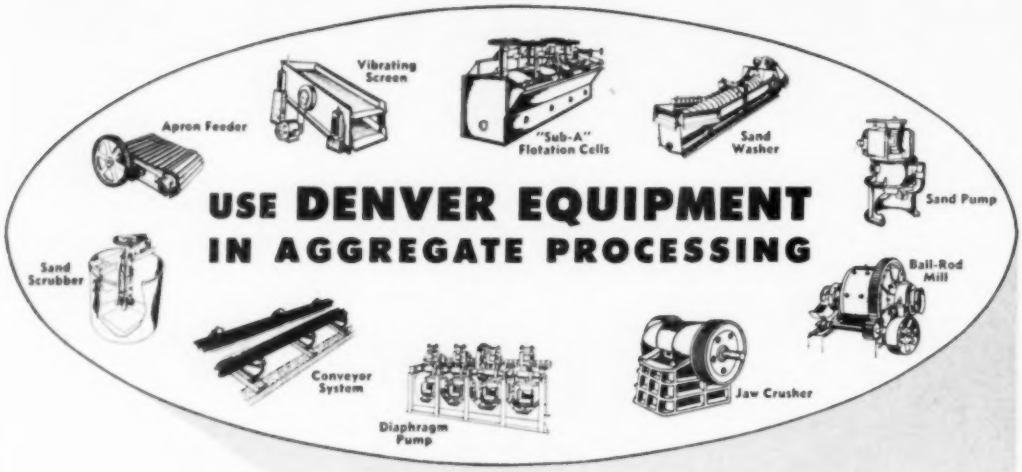
SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

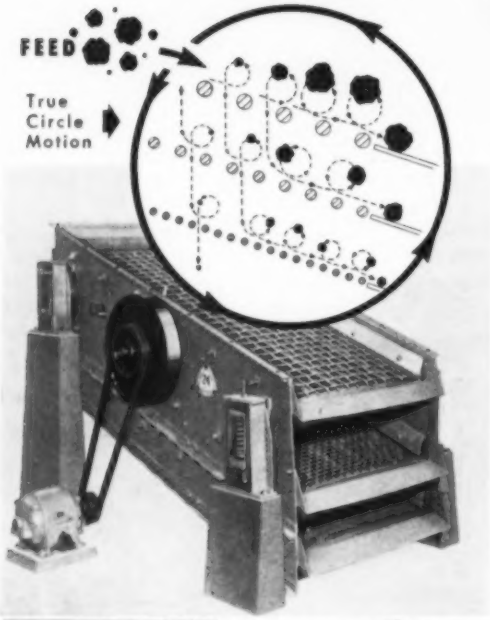
51 East 42nd St. New York 17, N. Y. • 211 W. Wacker Drive Chicago 6, Ill. • 713 Commercial Trust Bldg. Philadelphia 2, Pa. • 238 Main Street Cambridge 42, Mass. • Boehck Eqpt. Co. Milwaukee 3, Wis. • A. N. Wigle, 362 S. Ashburton Rd. Columbus 13, Ohio

Clyde Equipment Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 6, Calif. • Interstate Equipment Co., Statesville, N. C.

Rish Equipment Co., Charleston 22, & Clarksburg, W. Va. — Roanoke 7, & Richmond 10, Va. • Wilson-Woesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.



less fines in classified aggregate by using the



DENVER · DILLON Vibrating Screens

Better Cleaning . . . Less Penalty . . . More Profit. Material literally comes straight down hundreds of times over the complete area of the fully activated screen so that every particle of undersize passes through the screen. Result is a minimum of undersize in every sized product.

Circle Throw Eccentric More than Vibrates the Screen. The true circle motion lifts each particle up, back and directly down onto the screen cloth. Material more than flows across the screen . . . hundreds of times it moves up, back and down so that every particle of undersize passes through.

Result . . . a cleaner product . . . less penalty . . . more profit.

With the Denver Dillon Screen *you also get . . . Two Bearing Suspension . . . Fifty Percent Less Horsepower Consumption . . . Minimum Maintenance . . . No Blinding of Screen Cloth . . . and many other features.*

Want more information on this super screen?

Write today for Bulletin S3-B5, giving us some idea of your screening problem. You will receive a prompt reply and a solution.

FLOTATION ENGINEERS

DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

"The firm that makes its friends happier, healthier and wealthier"

DENVER • NEW YORK • CHICAGO • EL PASO • VANCOUVER • TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG

DENVER EQUIPMENT COMPANY, 1408 17th St., Denver 17, Colorado

SOUTHERN MATERIALS COMPANY ALMOST DOUBLES WIRE ROPE SERVICE LIFE WITH J&L CENTERFIT

J&L STEEL

ABOVE: This Dravo C-14 whirler crane with a clamshell bucket moves hundreds of tons of sand and gravel daily. Holding and closing lines are J & L CenterFit wire rope.

LEFT: CenterFit closing line on this multiple reeved clamshell lasted an average of more than five weeks longer than competing ropes in this application.

J&L CenterFit Holding and Closing Lines Outlast Nearest Competitor by an Average of More Than 5 Weeks

Here's a report on the service life of J & L CenterFit Wire Rope from the Southern Materials Company, Richmond, Va., large producers and handlers of Sand, Gravel, Ready Mixed Concrete, SOLITE and Slag.

Southern Materials used a Dravo C-14 whirler crane with a 2 cu. yard clamshell bucket to test four competing brands of wire rope, among them J & L CenterFit wire rope.

Among the ten ropes tested J & L CenterFit holding and closing lines had an average service life of nearly twice that of the competing brands.

This is how the ten ropes compared:

Brand	Service Life
A	5 weeks 3 days 5 weeks 1 day 5 weeks 1 day
B	5 weeks 3 days 5 weeks 6 days
C	7 weeks 4 weeks 6 days
J&L CENTERFIT	10 WEEKS 2 DAYS 14 WEEKS 10 WEEKS

It's no wonder that equipment owners are turning to CenterFit—the new wire rope produced exclusively by J&L for use on equipment having small sheaves and drums.

Unlike conventional wire ropes CenterFit is laid together in one operation. All strands run in the same direction with outside strands fitting snugly into the valleys between inside strands. This unique construction means more steel and fewer voids than any conventional wire rope. The result: Higher Strength . . . Greater Flexibility . . . Easier Handling . . . Longer Service Life.

Get the facts on this new wire rope design. Write Jones & Laughlin Steel Corporation, 465 Jones and Laughlin Bldg., Pittsburgh 30, Pa., for our free booklet, "CenterFit".

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

Six Important Conventions Are Just Ahead

Industries Covered Are:

Agricultural Limestone

Concrete Masonry

Crushed Stone

Ready Mixed Concrete

Sand and Gravel

THE winter convention season is just ahead for many of the important nonmetallic mineral industries and related industries. Important national meetings are scheduled for producers of agricultural limestone, sand and gravel, ready mixed concrete, crushed stone and concrete masonry. In conjunction with the concrete masonry convention the biennial exhibit of machinery and supplies will be held. There will be more exhibits than ever before, giving the producer an exceptional opportunity to examine and compare equipment in which he is interested.

Complete programs of all these conventions are not yet available but the information on hand indicates that they are up to their usual high standards. Recognized authorities, many of them members of or directly connected with these industries, will discuss the latest and most important developments affecting them. Subjects covered will include production methods, merchandising, research, governmental developments, present conditions and future prospects, etc. Open forums will invite wide participation in the formal discussion of vital problems.

• HAVE YOU MADE YOUR HOTEL RESERVATIONS? •
IF NOT, DO SO *NOW!*

Here are the Dates and Places

Sixth Annual Convention
National Agricultural Limestone Assn.
January 16, 17, 18, 1951
Statler Hotel, Washington, D. C.

Sixth Annual Convention
Agricultural Limestone Institute
February 7-9, 1951
Netherland Plaza Hotel, Cincinnati, Ohio

Thirty-First Annual Convention and 7th Biennial
Concrete Industries Exposition
National Concrete Masonry Assn.
January 22-25, 1951
Cleveland Public Auditorium, Cleveland, Ohio

Thirty-Fifth Annual Convention
National Sand and Gravel Assn.
February 12-15, 1951
Roosevelt Hotel, New Orleans, La.

Thirty-Fourth Annual Convention
National Crushed Stone Assn.
February 5-7, 1951
Netherland Plaza Hotel, Cincinnati, Ohio

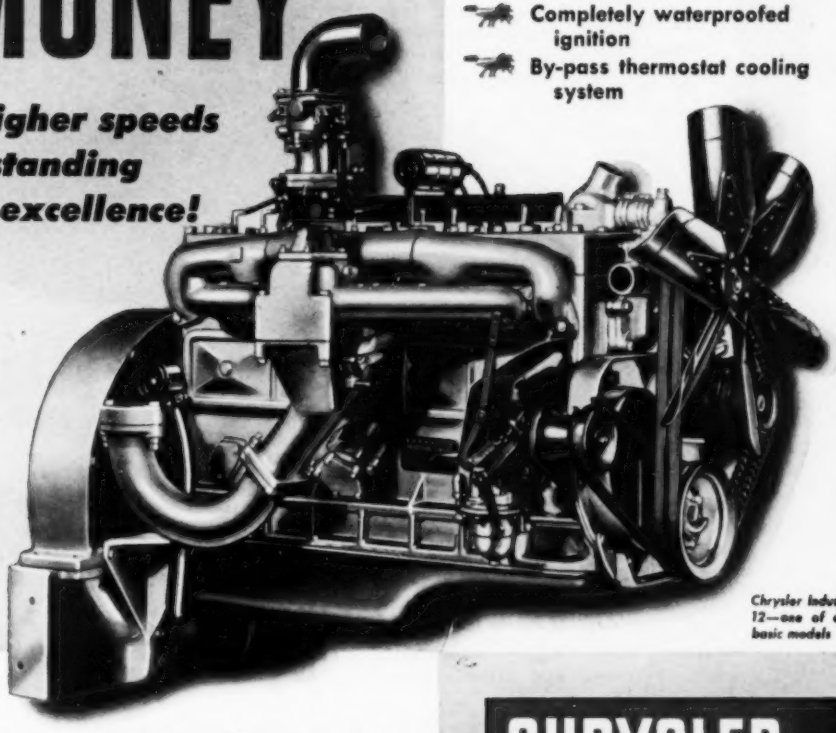
Twenty-First Annual Convention
National Ready Mixed Concrete Assn.
February 12-15, 1951
Roosevelt Hotel, New Orleans, La.

MORE POWER FOR LESS MONEY

assured by higher speeds and outstanding mechanical excellence!

Check these Features!

- All friction surfaces *Super-finished*
- Statically and dynamically balanced crankshaft
- Sodium cooled exhaust valves
- Stellite exhaust valve seat inserts
- Stainless steel valve springs
- Chrome top piston ring
- Completely waterproofed ignition
- By-pass thermostat cooling system



Chrysler Industrial 12—one of eight basic models

THE FACT that a higher speed engine can out-perform all others has long been established. Today, after years of field operation in every type of gasoline powered equipment, it has been conclusively shown that Chrysler Industrial Engines *out-last* and *out-economize* all other similarly rated engines. The reason lies in the outstanding achievements of Chrysler engineering and Chrysler research in higher alloy steels. And because of Chrysler mass production Chrysler Industrial Engines *cost less!* See your Chrysler Industrial Engine Dealer, or write us. ***Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.***

CHRYSLER INDUSTRIAL ENGINES

HORSEPOWER WITH A PEDIGREE!

CHRYSLER

Industrial Engines and Power Units

Service Available Everywhere

Completely New Tooth Has 6 Major Features

More and more operators of excavating equipment are specifying the new AMSCO® Rever-SharP

The new Amsco Rever-SharP—designed for use with power shovels, draglines and rippers—is now available in a wide variety of sizes. Th… new tooth combines the … work-hardening properti… ganese steel with a … portant construc…

The Rev… extens…

enthusia… too…

1. Manganese Steel Construction throughout—The Rever-SharP actually thrives on hard use . . . *the harder you use it, the harder it gets!*

2. Reversible Tip—when the cutting edges of the Rever-SharP are finally worn, simply turn the tip over. *It's self-sharpening.*

3. Reinforced Cutting Edges—specially designed extended corners are the first to work-harden, thus equalizing wear along the entire length of the cutting edge.

4. Heavy, Rugged Adaptor—extra metal protects base connections and lips. Now available for all base connections.

5. Reinforced Adaptor Nose—supported by ribs along entire length, making bending or breakage practically impossible. Special taper makes lips self-tightening during use.

6. Tapered Lock-Key—easy to insert and remove. Has rubber insert—can't work loose in service.

Enthusiastic users of the new Rever-SharP report higher digging efficiency—and as much as 6 times longer tooth life. It's a new development worth investigating—write today for the complete facts!

AMERICAN **Brake Shoe** COMPANY

AMERICAN MANGANESE STEEL DIVISION
396 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.

"Proper maintenance increases service life of water hose. Always drain hose after each use. Store in a cool dry place with coils evenly wound or placed on reels or saddles that have a large enough radius to prevent kinking."

"We're conserving rubber and saving money by using Republic Champion Water Hose on our Fourdrinier (Paper Making) Machines. Hose here takes a beating from dragging on concrete floors, constant flexing and continuous use. We're sold on Republic."

"Republic Distributors, like myself, are constantly solving difficult problems in the application of industrial rubber products. We can help you select the right product to do a better job."

Try Republic First...

GET LONGER SERVICE WITH CHAMPION WATER HOSE

Conservation of rubber is a national problem. We're glad that our half century of experience in manufacturing Industrial Rubber Products gives us the know-how to use available rubber to produce longer-lasting products. You capitalize on this experience when you "Try Republic First!" Your local Republic Distributor can show you ways to conserve rubber in your plant and cut your costs with the RIGHT Republic Rubber product used in the RIGHT way. Contact him or write us direct.

INDUSTRIAL RUBBER PRODUCTS BY

REPUBLIC RUBBER DIVISION

Lee Rubber & Tire Corporation

YOUNGSTOWN, OHIO

$10,000 SAVED ANNUALLY
on a $12,600 investment

$3,500 SAVED ANNUALLY
on a $4,200 investment

These are actual Case Histories

CASE HISTORY NO. 1

With a New Bulldog Hammermill crushing 20" and under Fuller's Earth, 50% Moisture

Before	*After*
Operation required one primary double roll, 8 screens, two secondary double rolls, with auxiliary equipment. Continuous clogging, produced irregular finished product, consumed excessive fuel in drying, extruding operations expensive.	Installing one Bulldog Hammermill. One stage operation, no clogging —no delays or shutdowns. Now produces a uniform cubicle product easily dried, saving fuel. Saves labor, maintenance, fuel and produces a better finished product.

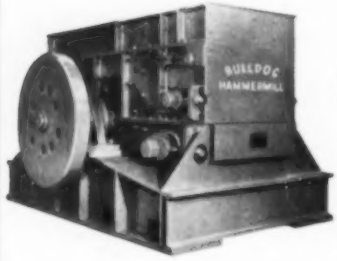
Second Hammermill purchased as a result of savings.

CASE HISTORY NO. 2

Rebuilding an existing operating Hammermill Crushing Limestone for cement

Before	*After*
Maintenance required replacement of 26,400 lbs. of manganese steel hammers and 12 sets of hammer bolts annually. Load capacity required extra operating hours. Primary grinding was not suitable for final roll type pulverizer.	With Bulldog rebuilding, the Hammer replacement was reduced to 3,600 lbs. manganese steel and one set of hammer bolts per year. Capacity increased 30% with less power consumption, better finished product saving power and maintenance in roll type pulverizer.

YOU CAN CUT COST — INCREASE CAPACITY — IMPROVE PRODUCT
with a
NEW BULLDOG HAMMERMILL



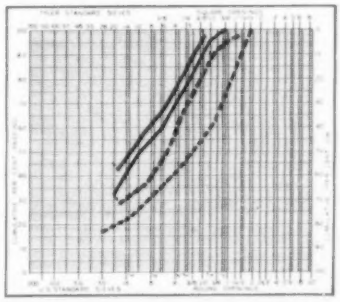
Compare your crushing operation with the actual proven results charted at right.

Solid red line **indicates material from Bulldog Hammermill with screens in closed circuit.**

Dotted red line **shows Bulldog Hammermill no screens, open crushing.**

***Solid black line* indicates standard impactor with screens in closed circuit.**

***Dotted black line* indicates standard hammermill no screens, open crushing.**



Bulldog Hammermills with Non Clog *Moving Breaker Plate* for sticky or high moisture materials or with *Stationary Breaker Plate* for dry materials are built in all sizes up to 72" x 60" for primary, secondary and fine reduction. Write for complete details.

A PRODUCT OF PETTIBONE MULLIKEN CORPORATION

Hammermills, Inc. is now a division of Pettibone Mulliken Corp., and has the tremendous facilities of PMCO. to back our products . . . with full control over research, construction and fabrication combined under one roof.

HAMMERMILLS, INC. *division of* **PETTIBONE MULLIKEN CORP.**

4750 W. Division St., Chicago 51, Illinois
'Phone SPaulding 2-9300

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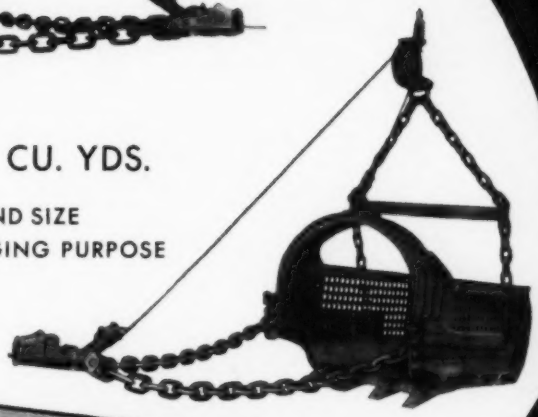
BUILT TO Out-Perform!



3/8 TO 40 CU. YDS.

A TYPE AND SIZE
FOR EVERY DIGGING PURPOSE

Combining rugged construction, larger capacity and perfect balance, HENDRIX DRAGLINE BUCKETS give smooth performance and low maintenance cost. These features mean BIGGER PROFITS to the users who have already switched to HENDRIX BUCKETS.

HENDRIX BUCKETS have proved themselves *in the field . . .* their performance and long-life prove Hendrix Buckets are tough! Repeat orders from all over the country prove HENDRIX BUCKETS ARE BEST . . . prove HENDRIX BUCKETS do out-perform!

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

For descriptive literature ask your dealer or write

HENDRIX MANUFACTURING CO., INC.

MANSFIELD — LOUISIANA

3 TOURNAROCKERS "very satisfactory on Pine Canyon project"

LeT LETOURNEAU EQUIPMENT

Mail today to: R. G. LeTOURNEAU, Inc., Peoria, Illinois

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____

Type work _____

- ☐ Send us more information
- ☐ Have Distributor call about: 35 m.p.h., 16-ton Tournarocker

Also interested in:

- ☐ 25 m.p.h., 9-ton Tournarocker
- ☐ 30 m.p.h., 35-ton Tournarocker

GOODFELLOW Brothers, Inc.,

tackled one of the northwest's toughest highway jobs . . . relocating 4.4 miles of U. S. 2 along steep sidewalls of rocky Pine Canyon, near Wenatchee, Washington. With over 600,000 yards of shovel rock to be carved out of the cliff face, some of the material is side-cast . . . much of it has to be hauled and dumped along the mountainside trail to widen narrow sections. Goodfellow Brothers, Inc., assigned the most difficult hauling to 3 LeTourneau 16-ton, rear-dump Tournarockers . . . and according to James B. Goodfellow "They are working out *very* satisfactorily".

Here are contractor's own figures

Loading under a 2-yard rock shovel, the Tournarockers carry 9 to 11 bank yards each trip. On one 2800-foot, one-way haul, actual job records show that Tournarockers easily handle shovel production of 1000 yds. every 8-hour shift. This rate of production, day in, day out, helps keep the job on schedule in spite of the rough haul roads, steep grades, and confined hauling conditions at altitudes of 2000 feet.

13′ 9″ turn radius speeds handling

Short, 90° turns, and positive electric steer by push-button control, permit easy turning and spotting anywhere along the narrow trail for load and dump position. Oversize, disc-type air brakes on all 4 wheels (4176 sq. in. total braking surface) give operators complete safety throughout the hauling cycle. Positive holding action of 4-wheel brakes . . . plus front-wheel drive on 186 h.p. Tournapull prime mover . . . let the Tournarockers dump safely out over the edge of mountainside fills. Simple electric hoist raises body to vertical position . . . streamlined bowl clears loads instantly.

Important savings for you

These same revolutionary Tournarocker advantages that are helping Goodfellow Brothers, Inc., lick steep slopes and rough going on the Pine Canyon project offer new low-hauling costs for your jobs, too. Ask your LeTourneau Distributor about this 16-ton, rear-dump Tournarocker. He can also give you complete information on 9-ton and 35-ton Tournarockers . . . and will show you money-saving interchangeability with Carryall Scrapers, bottom-dump hoppers, cranes, flat-beds and other auxiliary hauled units. Your investment dollar provides steady year-round earnings with interchangeable auxiliary units at approximately 25% of the cost of the original unit. Write or call NOW!

Big target . . . Operator on Goodfellow Brothers' 2-yard shovel has large target with Tournarocker's 12′ 5″ x 8′ top opening . . . speeds shovel swings, has less spillage.

Rock body . . . Here's a typical load of big-chunk rock carried by Tournarockers along Pine Canyon's slopes. 186 h.p. for 16-ton capacity licks the toughest hauling conditions.

90° turns with positive power steer . . . Short 13′ 9″ turning radius is an important advantage where operators have to turn and dump their loads along these narrow trails.

Front-wheel drive . . . Means you can keep the drivewheels of the prime mover on firm ground. Front or rear wheel air brakes can be set independently.

LETOURNEAU TOURNAROCKERS

PEORIA, ILLINOIS

HIGH SPEED on RUBBER PLUS TRACTION ADVANTAGES of a CRAWLER

Why...

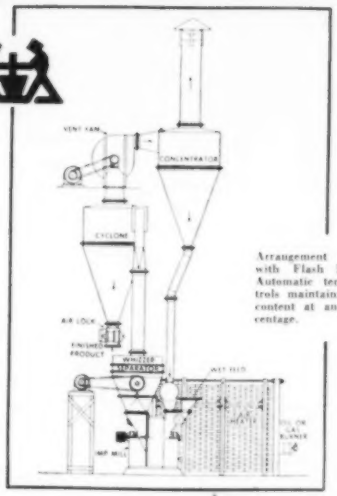
QUALITY-MINDED PRODUCERS

specify the Raymond WHIZZER-EQUIPPED IMP MILL

1 FLEXIBLE INSTALLATION

2 ECONOMY OF OPERATION

3 EASY FINENESS CONTROL



Arrangement of Imp Mill with Flash Drying Units. Automatic temperature controls maintain final moisture content at any desired percentage.

This unit has an enviable record in the softer non-metallics field for grinding, classifying, and simultaneously drying materials such as clays. Some of its many advantages are:

- Easily adjustable fineness with consistent finished products at any fineness specification.
- May be equipped with Flash Drying accessories to remove surface moisture while pulverizing.
- Adaptable to fit any floor plan or building layout.
- Automatic handling and air conveying from feed hopper to finish bin. No separate elevators or conveyors.
- Ruggedly and dependably designed for economical service.

The Raymond Whizzer-Equipped Imp Mill may well be the answer to your production problem. Ask for Catalog No. 67 and tell us about your requirements in detail.

COMBUSTION ENGINEERING – SUPERHEATER, INC.

Sales Offices in Principal Cities

Raymond
PULVERIZER DIVISION

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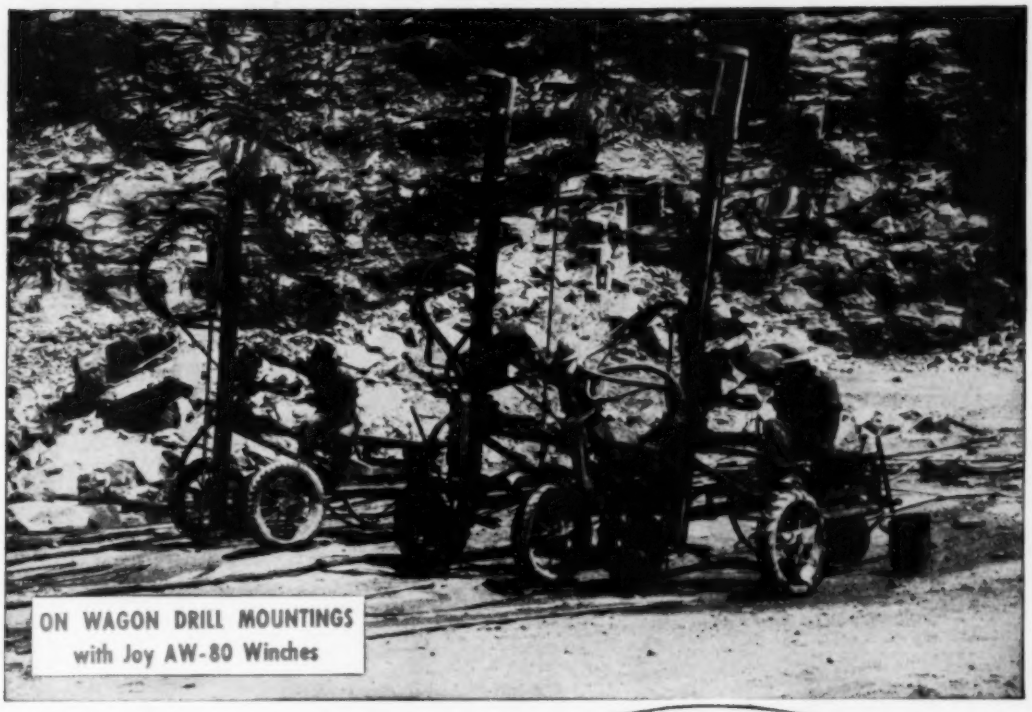
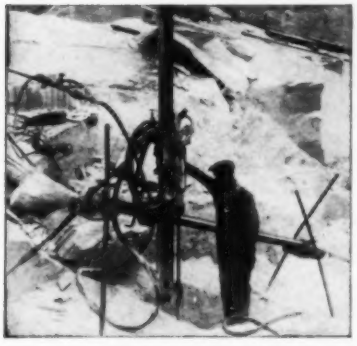
Chicago 22, Illinois



Put JOY SILVER STREAK DRIFTERS TO WORK ON YOUR JOB—



ON QUARRY-BAR MOUNTING

Watch daily footage *INCREASE* and costs per foot go *DOWN*!

JOY Silver Streak Drifters feature the exclusive *Dual Valve* with positive cushion control. It gives a harder, more powerful punch—literally makes air do more work. What's more, JOY Drifters *last longer*—give you more feet of hole with less maintenance. Exclusive *cadmium plating*, inside and out, inhibits rust, prevents scoring during run-in, and at the same time, adds power by permitting closer piston tolerances. ● Ask for a trial demonstration on JOY Drifters—the T-300, T-350 or T-400—*prove their all-around superiority right on the job!*

Write for Bulletin, or

Consult a Joy Engineer

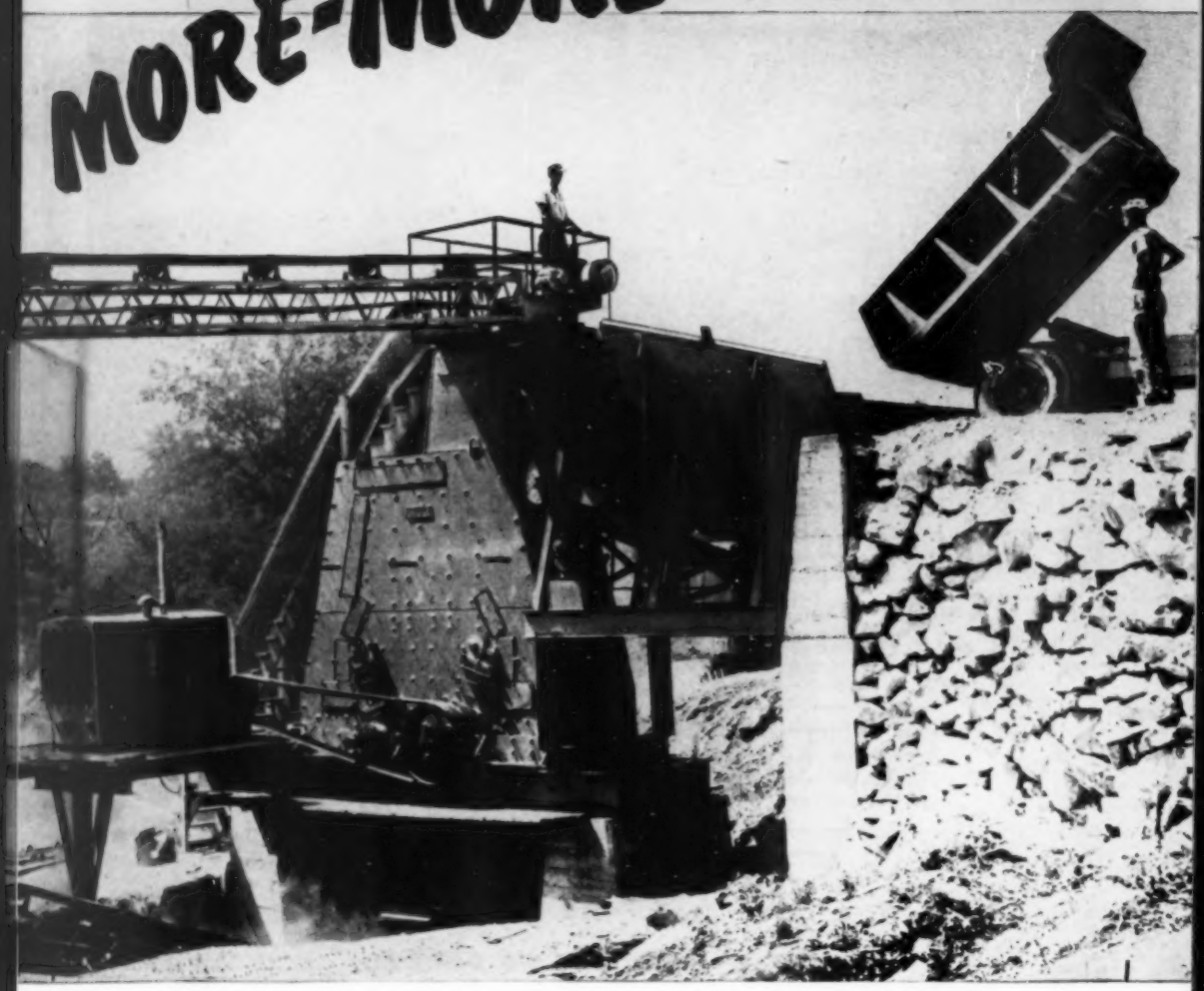
W&D R 2818

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

MORE-MORE-MORE



TYPICAL of dozens of installations, this Model 5050 Cedarapids Double Impeller Impact Breaker is producing tops in tonnage—and at lower cost. In a dolomite installation in Ohio, one operator claimed 720 tons per hour using two 150 H.P. Motors. In Florida, one Cedarapids Breaker is doing the work of three previous crushers in reducing a very abrasive coral rock down to minus 1". Ask your Cedarapids distributor for more field-proved facts on Double Impeller Impact Breaker action.

THE IOWA LINE *of Material Handling Equipment Includes:*

ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • BUCKET ELEVATORS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE AND GRAVEL PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • HAMMERMILLS • DRAG SCRAPER TANKS • WASHING PLANTS • SOIL COMPACTION UNITS • STEEL TRUCKS AND TRAILERS • KUBIT IMPACT BREAKERS • DOUBLE IMPELLER IMPACT BREAKERS

PRODUCTION

of Ideal Cubical Shaped Aggregate

with Cedarapids

DOUBLE IMPELLER IMPACT BREAKER

(formerly made by New Holland)

HERE'S the unit that will give you greater hourly tonnage capacities, better quality and shape of finished products, lower horsepower per ton of aggregate produced and a higher reduction ratio.

The Cedarapids Model 5050 Double Impeller Impact Breaker can produce up to 400 tons per hour of minus 4" clean, cubical aggregate required in so many specifications today. The smaller models—4040, 3030 and 2020 can deliver from 75 tons per hour—up, depending on the material fed, horsepower used and size product desired.

You can use the Cedarapids Double Impeller Impact Breakers for basalt, cinders, tuff, perlite, limestone, coral rock, sandstone, coal, copper ore, lead zinc ore, low grade iron ore, or dozens of other materials with a relatively low silica content. They will operate in wet, sticky material that jams, packs or clogs conventional machines.

U. S. Pat. No. 2,373,691
2,486,421
Canadian Pat. No.
439,371
Other Patents Pending

Set up your plants NOW— for stepped up capacity

PUT *your* plant in the big money picture with the high capacity production made possible by the Cedarapids Double Impeller Impact Breaker. Think of the profit in producing greater hourly tonnage of a better product . . . and at the same time reducing your power and maintenance costs, with a lower plant investment! The illustration at the right shows how it is done . . .

Rock is broken by impact (not crushed) into the ideal cubical aggregate required in so many specifications. And a high percentage of the material is *broken in mid-air* by rock striking rock! Result . . . the Breaker can be fed larger rocks, handles greater volume, reduces pit run material to specification size *in one pass.* This extremely high ratio of reduction reduces your plant investment because it eliminates the need for much accessory equipment such as screens, conveyors, secondary crushers, etc.

Stone broken in mid-air requires no power . . . you save on horsepower. Approximately 50% less contact of stone on metal keeps replacement and maintenance costs low.

Get this big volume, low cost set-up operating in your plant now!

IOWA MANUFACTURING COMPANY

Cedarapids

Built by IOWA

Cedar Rapids, Iowa, U. S. A.

JANUARY 1951 PIT AND QUARRY

ANNUAL FORECAST and REVIEW NUMBER

The BIG Issue with the Plus Values for Readers and Advertisers

For years PIT AND QUARRY has carried the largest volume of advertising—the largest number of advertisers — the largest number of exclusive advertisers.

Again this January, PIT AND QUARRY will publish its Annual Forecast and Review Number. The 1951 Number will set new publishing standards with a bigger, more complete, more attractive issue . . . and with many plus values.

Only PIT AND QUARRY with its unrivalled editorial staff and industry experience could undertake and carry through an editorial project of this magnitude.

The January Number will show that 1950 was one of the two best years for the Non-metallic Minerals Industries, and that 1951 may surpass them.

More emphasis will be placed on forecasts—readers and advertisers are more interested in the future than in the past. Over the years, the forecasts made by the editors of PIT AND QUARRY have been remarkably accurate.

Complete program and advance information on 5 big conventions to be held in January and February:

National Agricultural Limestone Association
National Sand and Gravel Association
National Ready Mixed Concrete Association
National Crushed Stone Association
Agricultural Limestone Institute
National Concrete Masonry Association.

Plus . . . layouts and location of manufacturers' exhibits at the gravel and stone conventions.

Plus . . . advance reports on expected volume of 1951 construction—highways, dams, bridges, buildings, houses, private, industrial and government work.

Plus . . . illustrations of the important projects.

Plus . . . review of important machinery and equipment developments of the past year.

Plus . . . regular features and departments on vital business and production problems, news, personal items, trade,traffic, and legal notes, and the regular new machinery section.

America's great and growing construction program is placing heavy demands for the products produced by the readers of PIT AND QUARRY. And, these readers are buying huge quantities of equipment and supplies to keep pace with these demands.

The big January PIT AND QUARRY offers plus values for both readers and advertisers. Extra distribution—extra reader interest, at no extra cost. It is an issue that is kept and referred to for months.

Plan now to use big space to get your product story over big to the industries important equipment buyers. Time is short—send space reservation today.

14,363 A. B. C.
Highest Circulation in our History

81.70 **Renewal Percentage**

PIT AND QUARRY
538 SOUTH CLARK ST. • CHICAGO 5, ILL.

EXTRA DISTRIBUTION - EXTRA READER INTEREST - NO EXTRA COST

WRITE OR WIRE SPACE RESERVATION TODAY

High Power, High Speed, High Efficiency combined in LINK-BELT SILENT CHAIN DRIVES

RUGGED

Link-Belt Silverstreak silent chain drives combine ability to carry heavy overloads with the resilience that sustains and absorbs shock.

DEPENDABLE

Silverstreak silent chain drives cost practically nothing for upkeep—run 10, 20, or more years without attention beyond occasional oiling.

COMPACT

Operating efficiently on short centers, they save valuable space. Ratios as high as 10 to 1 are commonly used.

EFFICIENT

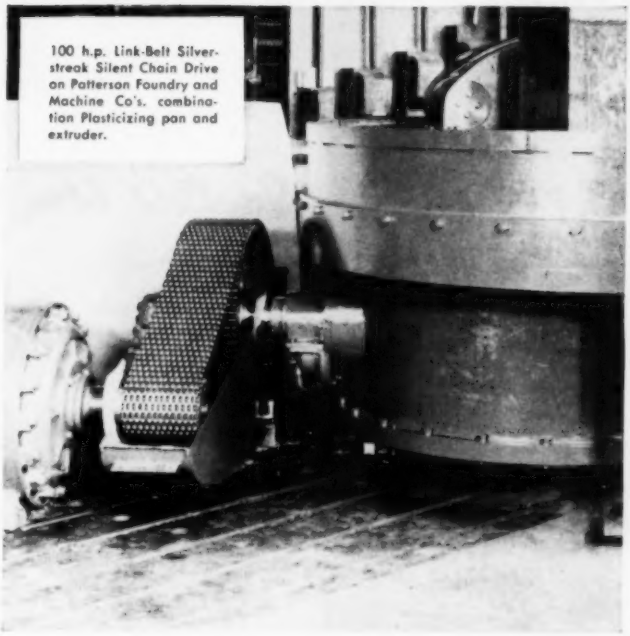
98.2% efficiency maintained throughout the life of the drive.

POSITIVE

As the chain, in the form of a flexible rack, meshes with the teeth of the sprocket, the drive cannot slip.

PRE-SELECTED STOCK DRIVES

Chains and sprockets for drives from ½ to 50 h.p. are available from stock at Link-Belt distributors and factory branch stores in all principal cities.



100 h.p. Link-Belt Silverstreak Silent Chain Drive on Patterson Foundry and Machine Co's. combination Plasticizing pan and extruder.

Link-Belt Silverstreak silent chain is the most efficient and durable medium for the transmission of power at high speeds. Entirely constructed of steel, and enclosed in an oil-tight casing, it will give dependable service with sustained efficiency for long periods. Link-Belt Silverstreak silent chain drives are outstanding where efficiency, wide adaptability and low over-all costs are important. Tested by years of service, they are the most modern type you can use.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg. Offices, Factory Branch Stores and Distributors in Principal Cities. 12,044-A

LINK-BELT Silverstreak SILENT CHAIN DRIVES

Vol. 43 DECEMBER 1950 No. 6

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Copyright 1950 by Complete Service Publishing Co., 538 S. Clark Street, Chicago 5, Illinois.

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PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

PIT AND QUARRY

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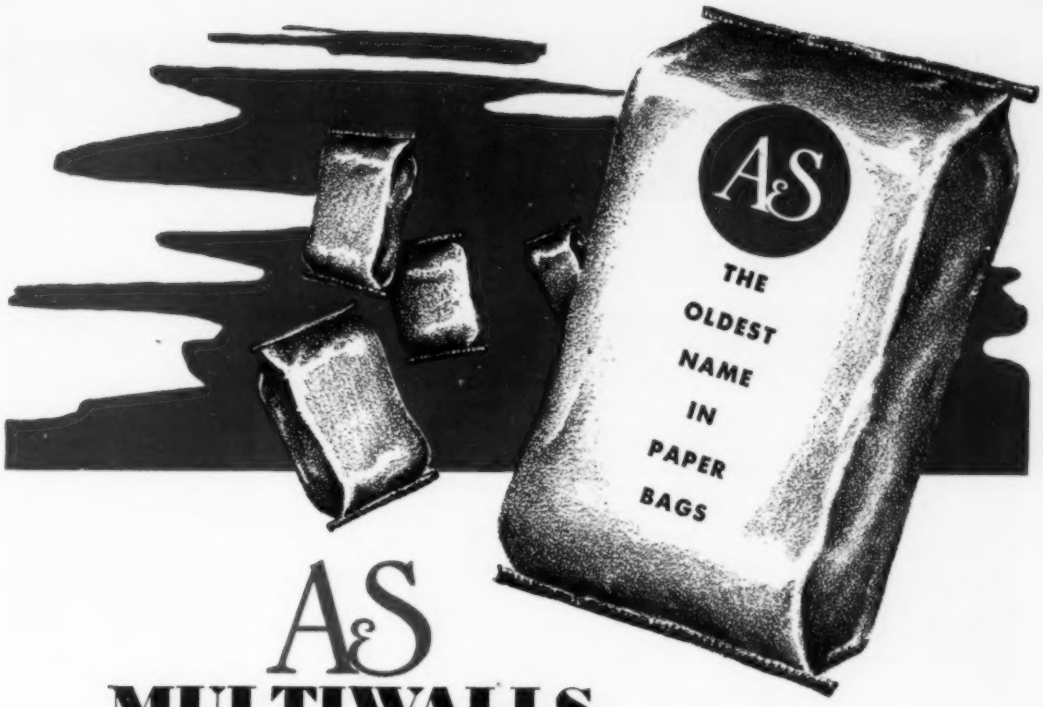

A&S MULTIWALLS *stand* UP *and* OUT!

RECENT DEVELOPMENTS FROM THE A&S PACKAGING LABORATORY

- **EXPENDABLE PALLETS**
  Palletized shipments of A&S bags lower your handling costs, minimize storage space.
- **STA-STAK BAG**
  Creped outer wall takes skid and slip out of stacking. Greater resiliency, easier handling.
- **SHUR-CLOSE**
  Ingenious bag valve assures less dust when packing — less sifting when packed — prevents waste.
- **PLASTO-PAK BAGS**
  Polyethylene lined, moisture-proof protection for hygroscopic materials with exclusive "Electro-Seal" bottom closure.
- **SUPER GLOSS FLOUR BAG**
  Toughest of flour bags is bright white with brilliant inks to provide sparkling, appealing shelf packages.
- **ARK-TONE PRINTING**
  Sharp, clear color process combines perfect reproduction and brightness for consumer packages.
- **HI-TONE PRINTING**
  Strong, deep colors for sugar, salt, rice and similar bags.
- **PRESSUR-PAK BALE**
  Bags are packed under pressure. Saves 50% of customers' space allotted to storage.

● A&S Multiwall bags *stand up* under all kinds of shipping and storing abuse, because every ply is made of No. 1 specification kraft, and every bag must pass the rigid A&S spot inspections.

A&S Multiwalls *stand out* because they are printed on modern 4-color presses that reproduce a bag design in eye-arresting colors unsurpassed in commercial bag printing. Why not have our A&S packaging specialists analyze your packages? These men know how to build impact into the flat exterior of what could otherwise be a dull and unimaginative package. This combination of unusual design and faultless printing is yours at no extra cost.

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editorial

The Coming Conventions

ONLY a few weeks away are the most important conventions of the year for many of the nonmetallic minerals industries, including agricultural limestone, crushed stone, sand and gravel, and the related ready-mixed concrete and concrete products industries. While all details of their programs are not yet available, it is apparent that they will be at least on a par with the excellent programs at past meetings. All important subjects affecting these various industries will be thoroughly discussed. As usual, well-balanced programs of entertainment have also been arranged for those attending and for the ladies.

The conventions referred to are those of the National Agricultural Limestone Association, Statler Hotel, Washington, D. C., January 16-18, 1951; the National Concrete Masonry Association (with Concrete Industries Exhibit), Cleveland Auditorium, Cleveland, Ohio, January 22-25, 1951; the National Crushed Stone Association, February 5-7, 1951, and the Agricultural Limestone Institute, February 7-9, 1951, both at the Netherland Plaza Hotel, Cincinnati, Ohio; the National Sand and Gravel Association, and the National Ready Mixed Concrete Association, February 12-15, 1951, both at the Roosevelt Hotel, New Orleans, La. As in past years all producers, whether or not they are members, are invited to the conventions of these associations. The Concrete Industries Exhibit is open to all, and non-members may obtain invitations to attend the N.C.M.A. meetings by writing to that association.

RECORD-BREAKING attendance seems assured at most of these conventions, especially those centrally located. Some of the associations have had remarkable increases in membership during the last year in both regular members and associate members. This increase in the number of producers joining associations of their industries can be attributed only partly to the fact that these industries are growing and that producers are prospering. It must also be due in part to an increasing awareness of what the associations are doing and can do for them. Business in the nonmetallic minerals industries is becoming more and more complex in all its phases, from producing to meet increasingly numerous and rigid specifications to complying with the innumerable labor, tax and other regulations governing the conduct of such a business. Added to this is the threat of growing government control which has already affected some of these industries through the restriction of certain types of construction, and in other ways. Associations are one of the best sources of specialized information on these subjects.

Programs for most of the conventions are not yet available, even in tentative form, but we can assure producers that all subjects of vital importance to them will be discussed by people who are well informed on them. There will be addresses by leading authorities, both from within and outside the nonmetallic minerals industries, on timely and important subjects. Speakers will include top association executives and technical directors, government bureau heads, research, legal and business experts, and top-flight producers. Important problems affecting producers in these industries, directly or indirectly, nationally or locally, will be thoroughly analyzed. The best available information will be presented on current business conditions and future prospects (both for industry in general and these industries in particular), governmental action, labor, legal matters, equipment, material and car supply, methods of operation, specifications, availability of raw materials, costs, prices, etc. All speakers will be prepared to answer questions at the conclusion of their addresses and to participate in discussions of their subjects.

Open forums on various subjects have become established features at these conventions, and this year there will be more of them than ever before. The operating forums, especially, will be more informative than formerly, as the many representatives of machinery manufacturers who will be present are being invited to take an active part in the discussions. These forums are open to all and are informal affairs, guided by experts in these fields, in which everyone can, and many do, participate. Nowhere else can a producer get access to the combined knowledge of so many of the top experts in these industries.

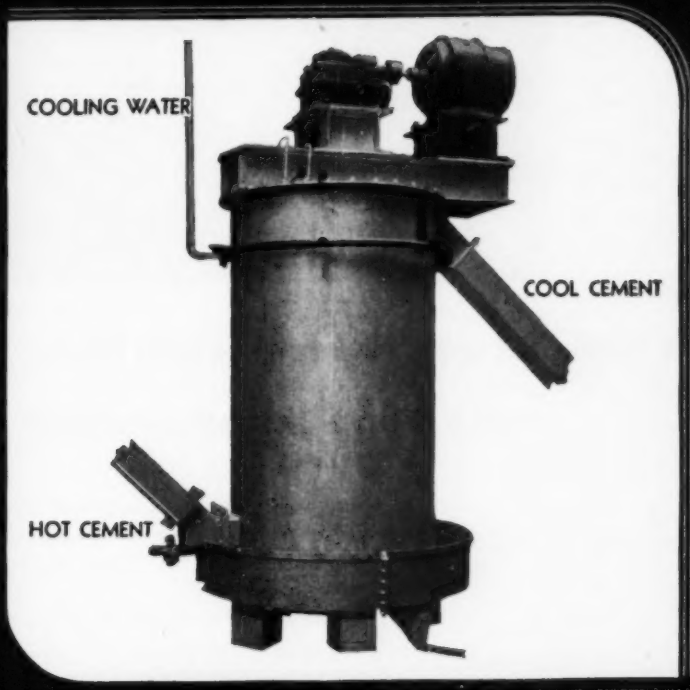
THE only association to hold an exhibit of machinery and equipment will be the National Concrete Masonry Association, which is holding its 7th Biennial Concrete Industries Exposition. This show will be even larger and more interesting than the record-breaking one held in the same place two years ago, with more exhibitors and larger exhibits than at any other. Although the other associations will not have exhibits, there will be a large representation of machinery men who, in the open forums and elsewhere, will be ready to answer all questions.

The complete official program of the National Agricultural Limestone Assn. is published in the news section of this issue. The programs of the other associations mentioned will be published in the January Annual Forecast and Review Number of PIT AND QUARRY and in the CONCRETE MANUFACTURER section of that issue.

Plan to attend the meeting of your industry's association and make your hotel reservations at once.

Walter E. Trauffer

FOR COOLING HOT CEMENT



Cement manufacturers are frequently confronted with the problem of cooling hot cement to temperatures acceptable when making bulk shipments or for immediate packing in paper bags. The FLS Cement Cooler was especially developed for cooling hot cement. • The FLS Cooler consists of a tank, water-cooled externally, the cement being introduced into the bottom and conveyed in a thin layer along the inside of the water-cooled wall to the top, where it is discharged. Thus an intimate contact is established between the cement and the water-cooled surface, assuring high-cooling efficiency. • In addition to cement, the Cooler is applicable to many other similar *dry* pulverized materials.

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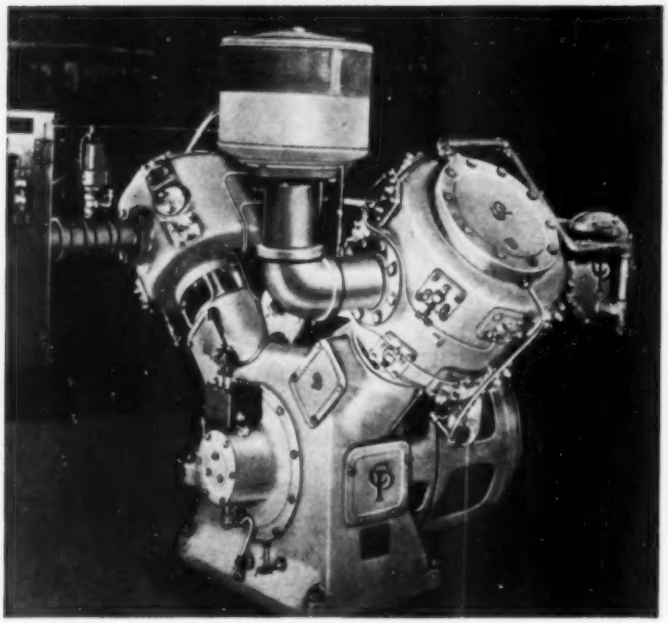

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news of the industry

PIT AND QUARRY

Huron Portland Cement Patents New Gravity Air-Activated Conveyors

Huron Portland Cement Company, Detroit, Mich., has announced the issuance of patents covering their new air-activated gravity conveyors and accessories. The patents were issued on October 24, 1950, and are as follows:

2,527,455—an air activated gravity conveyor having a conveying surface of flexible fabric.

2,527,488—an air activated gravity conveyor having a conveying surface of low air permeability porous stone capable of handling hot materials.

2,527,466—an air activated gravity conveyor having a conveying surface of flexible fabric formed as a loop in verticle cross section.

2,527,394—a side take-off valve for air activated gravity conveyors.

2,517,837—issued August 8, 1950—a bottom take-off valve for air activated gravity conveyors.

Huron Portland Cement Company has granted an exclusive license for all industrial uses to Fuller Company, Catasauqua, Pa. The Fuller Company is now manufacturing under its trade mark "F-H Airslide". Licenses have also been granted to the Gramm Trailer Corporation, Delphos, Ohio, and to The Trailmobile Company, Cincinnati, O., for the use of these conveyors in motor vehicles for bulk material transportation.

Leading Cement Concerns Up Prices—Others May Follow

Cement prices have advanced an average of 10 cents per barrel for bulk and 12 cents per barrel for bagged material in recent weeks. These increases were passed on in most instances and resulted in a retail hike of about 4 cents per bag of 96 lbs.

The following firms were among those announcing the new price increases: the Pennsylvania Dixie Cement Company, the Alpha Portland Cement Company, the Marquette Cement Manufacturing Company, and the Medusa Portland Cement Company. Price hikes were indicated but had not been definitely determined by the Universal Atlas Cement Company and the Huron Portland Cement Company. They were expected to be approximately the same as those announced by the other companies.

The price rise was brought about by increased costs of labor, materials and bags, according to press releases from these companies.

Earnings for the National Gypsum Company for 1950 were estimated by Melvin Baker, president, at close to $9,500,000, as compared with $5,863,707 in 1949.

Coming Events

January 16-18, 1951 — Washington. National Agricultural Limestone Association, Statler Hotel.

January 22-25, 1951 — Cleveland. 31st annual meeting and exhibit, National Concrete Masonry Association. Cleveland Auditorium.

January 28- February 1, 1951— Chicago. 32nd annual meeting, Associated Equipment Distributors. Stevens Hotel.

February 5-7, 1951 — Cincinnati. 34th annual convention, National Crushed Stone Association. Netherland Plaza Hotel.

February 7-9, 1951 — Cincinnati. 6th annual convention, Agricultural Limestone Institute. Netherland Plaza Hotel.

February 12-15, 1951 — New Orleans. 35th annual convention, National Sand and Gravel Association and 21st annual convention, National Ready Mixed Concrete Association. Roosevelt Hotel.

March 1-3, 1951—New York. 43rd annual convention, American Concrete Pipe Association. Waldorf-Astoria Hotel.

$600,000 Expansion Planned By Calaveras Cement At San Andreas Plant

William Wallace Mein, president of Calaveras Cement Company, has announced that the company is investing $600,000 in the expansion of its San Andreas plant.

He said the additions in equipment will enable the plant to continue at full capacity during the slack winter months, producing large inventories of cement for distribution when demand increases again in the spring.

The important part of the new installation is expected to be completed early in December. The company completed a $2,500,000 postwar plant expansion program only a year ago.

Included in the new program are the installation of additional raw and finish mills and the construction of four new cement storage silos and four new slurry silos.

Texas Panacalite Company Opens $100,000 Irving Plant

At Irving, Tex., the newly-completed plant of the Texas Panacalite Company, representing an investment of $100,000, recently went into production with a capacity of 50,000 bags (4 cu. ft. each) per month. Perlite from lava beds in Utah is processed into lightweight material for concrete and plaster. The firm was named for Panaca, Utah, where the volcanic material is mined.

The company operates under a franchise from the Combined Metals Reduction Company of Salt Lake City. There are at present six other franchised Panacalite plants in the United States.

Heading the Dallas company are the following: S. W. Johnson, president and manager; H. D. Johnson, secretary-treasurer; and Richard M. Cowan, vice-president. H. L. Anderson is plant superintendent. On the sales staff are Harry Penniman and A. E. Ritchey.

Construction of an addition at the Canada Cement Company's plant at Exshaw, Alta., 57 miles west of Calgary, at a cost of $5,000,000 was announced by H. R. Milner of Edmonton, director. He said the extension will boost production to about 10,400,000 bags annually.

Dodge Corp. Anticipates 19 Percent Decline in '51 In Construction Volume

Building and engineering contracts will decline 19 percent in 1951 relative to 1950 in the 37 states east of the Rockies, it is estimated in the annual November outlook of F. W. Dodge Corporation, according to the *Architectural Record*.

The estimates are authored jointly by Thomas S. Holden, president of F. W. Dodge, and Clyde Shute, assistant vice-president in charge of the statistical division.

"This is a cut-back from the peak construction volume of all time," they state. "It leaves a dollar total measurably greater than that of any year except 1950, and a physical volume total that would compare favorably with other prosperous construction years.

"We question whether there will be much change in the level of construction costs in 1951. Some materials will be tight; others which were tight in 1950 will be plentiful and competitively priced.

"Demand for building labor will ease somewhat, with reduced construction volume, though doubtless many men who have been employed in construction in 1950 will shift to defense production."

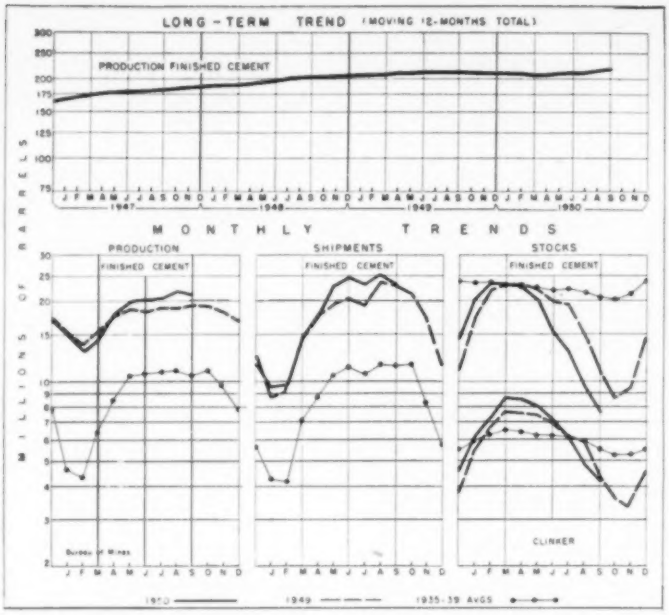
The authors attribute "the moderate extent of the anticipated decline" to these reasons, summarized: partial rather than total mobilization; prospectively increased production of key materials; reduced output of motor vehicles and other consumer durables; ingenuity in conserving and substituting of materials; and the view held by "responsible leaders in government that a strong civilian economy with maximum freedom is just as essential for preparedness as an enlarged military establishment".

"Government officials announce the intention of cutting 1951 housing production back one-third from the total 1950 volume; from approximately 1,300,000 back to 850,000 new non-farm dwelling units," the writers say. "We incline to the opinion that Regulation X is quite severe and that its effect, unless modified, would be to reduce housing volume considerably more than one-third.

"In our estimates we have assumed that Regulation X will be moderated some time next year, if such action proves necessary to produce in 1951 approximately two-thirds of the 1950 housing volume. It is our view that 800,000 to 850,000 new non-farm units would adequately meet 1951 housing requirements."

Control prospects are uncertain, the writers believe. "The present prospect is," they write, "that controls will be imposed on a more or less experimental basis. Apparently the dominant thought in responsible government circles today is that controls should be kept to the minimum."

The F. W. Dodge estimate is that combined residential and nonresidential contract valuations in the 37 states east of the Rockies in 1951 will decline 24 percent from 1949 totals, but that public and private works and utilities, also known as heavy engineering, will remain at the same dollar total, to bring the total of all construction down 19 percent. The estimate is that nonresidential building will decline 10 percent, and residential 35 percent.



SUMMARY—The output of 20,945,000 barrels of finished portland cement during September, 1950, as reported to the U. S. Bureau of Mines, was 9 percent greater than that for September, 1949. Mill shipments totaled 22,910,000 barrels—an increase of 1 percent over the September, 1949, figure, while stocks of 7,643,000 barrels were 29 percent below the total of a year ago. Clinker output during September, 1950, reached 20,392,000 barrels—13 percent above the production reported for the corresponding month of 1949.

PRODUCTION—The production of 20,945,000 barrels of finished cement in September, 1950, came from 150 plants located in 36 states and Puerto Rico. During the same month of 1949, 19,181,000 barrels were produced in 146 plants. As indicated above, clinker production was up 13 percent over the September, 1949, figure.

SHIPMENTS—Mill shipments of finished cement, declining somewhat from the August, 1950, total, amounted to 22,910,000 barrels. Shipments were greater in nine districts and smaller in nine districts than those recorded for September, 1949. The percentage changes range from a decrease of 41 for the Oregon-Washington district to an increase of 27 in the Colorado-Arizona-Wyoming-Montana-Utah-Idaho district. Shipments increased 1,254 percent in the Puerto Rican district.

STOCKS—Mill stocks of finished cement on September 30 amounted to 7,643,000 barrels —29 percent below the September, 1949, figure, while stocks of clinker were 4,170,000 barrels—down 7 percent from the same month of the previous year.

Struck Pennsylvania Plant Opens after Settlement

Relief from an acute cement shortage in the Philadelphia area came when an 88-day strike at the West Conshohocken (Pa.) plant of the Allentown Portland Cement Company was terminated. The 175 workers of the plant returned to their jobs after an agreement had been reached between the company and Local 449 of the United Gas, Coke and Cement Workers (CIO).

According to union officers, the settlement provided for a wage increase of 8 cents per hour, and other benefits not exceeding 3 cents per hour. An additional 5-cent wage hike will go into effect on April 1, 1951. The settlement was made retroactive to the beginning of the strike.

Opening of storage facilities, which had also been closed during the strike, made possible the immediate shipment of three carloads of cement to the eastern extension of the Pennsylvania Turnpike, where work had been kept going by shipments from the firm's Evansville (Ind.) plant.

Pennsalt's Chicago Office Moved to New Quarters

Pennsylvania Salt Manufacturing Company has announced the removal of its Chicago district sales office to Suite 1216, Builders Building, 228 North La Salle Street, from 20 N. Wacker Drive, Chicago, Ill.

The new office will be under the direction of George D. Grogan district sales manager for the company's Heavy Chemicals Department, and John C. Hampson, district sales manager for the Special Chemicals Department.

French Cement Producer Reports on Expansion Of Six-Plant Concern

From an interesting letter written by one of our overseas subscribers, E. Palancher, general director and administrator of Poliet & Chausson of Paris, France, we have learned that this cement manufacturing firm is among the leading concerns in its field. Its six plants manufactured 1,500,000 tons of cement last year.

Since the end of World War II the output of the plant at Gargenville has been increased from 250,000 to 450,000 tons annually. This increase was accomplished through the installation of a 150-meter kiln, producing 750 tons of clinker daily, and two 1,200-hp. cement mills of the latest design. A new 5,000-cu. meter mixing basin will soon be put into service, to increase clinker production.

M. Palancher states that various installations have been made recently in the firm's other plants to modernize the kilns and step up production. Poliet & Chausson also operate plaster plants which produce about half of the nation's plaster output.

Idaho Portland Cement Co. Completing Inkom Plant

Cement production at the Inkom, Idaho, plant of the Idaho Portland Cement Company soon will be more than doubled when that firm's new plant goes into production. The announcement was released by E. A. Dufford, sales manager.

The 320-ft. kiln, resting on 24-ft. high piers, ends at a slurry basin 31 ft. high and 64 ft. in diameter. The MacDonald Engineering Company of San Francisco is the construction contracting firm in charge of the new kiln. Originally the plant was scheduled to go into production on January 1, 1951, but because of difficulties in obtaining materials, the completion date has been postponed.

Riverside Cement Company Plans $75,000 Bulk Plant

A 2,000-barrel bulk cement plant is being planned by the Riverside Cement Company, at San Diego, Calif., according to John C. Allen, vice-president.

Cost of the plant is estimated to be $75,000. The plant will be erected on two acres of tidelands leased for 20 years. Plans call for four silos each 40 ft. high, a railroad spur, and handling equipment for truck and rail shipments.

1,000,000-Bbl. per Year Plant Sold by Puerto Rican Govt.

The Puerto Rico Cement Corporation, established by the Puerto Rico Reconstruction Administration in 1939 and taken over by the island's Development Administration in 1942, was sold to private interests this fall.

The plant originally had a capacity of 350,000 barrels, which was increased during World War II to 1,000,000 barrels yearly. Earnings exceeded $1,000,000 annually.

Government officials explained that the plant was built as part of a policy to aid in the establishment of new industrial enterprises, and to supplement private capital when it was insufficient to carry out the necessary development. Sale of three other industries was also announced by the government agency.

Pittsburgh Silica Sand Co. Closes Everett, Pa., Plant

Operation of the Pittsburgh Silica Sand Company's plant at Everett, Pa., was discontinued recently. Officials of the firm stated the plant would be liquidated, since efforts to sell it as a unit had failed. Thomas MacConnell II, president of the concern, died last summer.

Opened 20 years ago, the processing plant has been in operation continuously since that time, with the exception of several brief stoppages.

$4,580,000 Cement Plant To Be Built in Brazil

A cement plant to cost an estimated $4,580,000 is to be built in Brazil near Salvador in the state of Bahia. This location was chosen because of raw materials supplies available from old coral beds, and because of the presence of natural gas in the Bahia oil fields.

Capacity of the plant will be 100,000 tons per year. Construction will be aided by a $2,070,000 loan from the Export-Import Bank.

Union Gypsum Company Sells Facilities to Certain-Teed

According to Carlton M. Rogers, president of the Union Gypsum Company, Phoenix, Ariz., his firm recently completed the sale of its Arizona properties to the Certain-teed Products Corporation of Ardmore, Pa.

Mr. Rogers stated that key operating and sales personnel in Phoenix, most of whom have been with Union Gypsum since it began operations in 1946, are remaining as members of the new management.

Certain-teed's President Rawson G. Lizars announced that Certain-teed will launch an enlargement program of the present plant facilities and that the plant will be closed during the alterations.

Johns-Manville Opens Large Asbestos Deposit In Shasta County, Calif.

Probably the largest asbestos deposit of its type in the United States is being vigorously developed by the Johns-Manville Company in Shasta County, north of Redding, Calif. It is a chrysotile deposit containing an excellent grade of spinning-grade fiber. A number of other deposits in northern California both chrysotile and amphibole in occurrence, are also under preliminary development by several independent operators.

American manufacturers, long dependent almost entirely on Canadian sources for raw asbestos, are eagerly watching the activity in California. First concrete recognition of the developments is an announcement by the Keasbey & Mattison Company, Ambler, Pa., of the proposed erection of a $2,500,000 asbestos-products plant on a 20-acre site at Santa Clara, Calif. Keasbey & Mattison manufactures cement-asbestos pipe, shingles, siding, and other products at its plants in St. Louis and New Orleans. It anticipates the use of considerable asbestos from the new California mines in the new Santa Clara plant.

Asbestos deposits at other California points have been reported, with Shasta and Trinity counties being especially rich. So far all of the deposits have been north of Napa.

"Biggest Ever" Production Put On by Kennedy-Van Saun

According to Byron Pyle, vice-president of the Kennedy-Van Saun Manufacturing and Engineering Corporation, the company is engaged in the largest cement plant construction program in its history. More than $20,000,000 in construction has been completed recently, and new contracts are at a record high. Plants are scheduled to be built for Mexico, East Africa, West Africa, and Italy.

Final shipment of a $1,000,000 order of mill equipment left this country in September for a new cement plant at Shiraz, Iran. Two additional cement plants are scheduled to be shipped to Iranian locations.

The firm recently furnished new facilities for the Lehigh Portland Cement Company at plants in Washington, Iowa, and Virginia, and a 200-ton-a-day lime plant was completed in Texas this year.

• Union Gypsum Company's plant at Phoenix, recently sold to Certain-teed Products Corp.

Construction Totals Shrink In Oct.—Home Building Hits 1,100,000 in 9 Months

New construction activity turned downward in October from the record rate which it had maintained throughout the summer, the U. S. Labor Department's Bureau of Labor Statistics and the Construction Division, U. S. Department of Commerce reported. The total value of all types of new construction put in place during October amounted to about $2,700,000,000, or 4 percent less than the September total.

A decline in the amount of private homebuilding was the principal cause for the drop in total construction activity. Highway construction also declined, but most types of nonresidential building, both private and public, increased over September levels. Expansion of industrial and commercial building activity was particularly marked, reflecting the high rate at which contracts have been awarded during the past few months.

Before the downturn in private homebuilding in October, a new record had already been established this year for the number of new dwellings placed under construction. A total of more than 1,100,000 new nonfarm dwellings were started during the first 9 months of 1950, as compared with 1,025,000 in all of 1949 and the previous annual peak of 937,000 in 1925.

During the first 10 months of 1950 new construction with a total estimated value of $22,800,000,000 was put in place, 22 percent more than the total for the same period in 1949. Nearly $9,500,000,000 of the total for the first 10 months of this year was made up of outlays for new nonfarm dwellings, 63 percent more than during the first 10 months of last year. The amount of private nonresidential building was up about 10 percent from last year, when the first 10 months are compared, and public construction was up about 8 percent.

Technical Group Inspects U. S. Lime Products Plants

The Western Section, National Open Hearth Steel Committee, Iron & Steel Division, A.I.M.E., with headquarters in Los Angeles, Calif., held its annual all-day technical session and banquet on October 14.

This year a week-end trip to Las Vegas, Nev., was scheduled so that the Sloan, Apex, and Henderson plants of the United States Lime Products Corporation could be visited. Following the tour the corporation was host to the members at a cocktail party and dinner at the Last Frontier Hotel. Thirty-three members of the Western Section were present at Las Vegas, and 40 attended the evening festivities.

The officers of the Western Section for the current year are: permanent chairman, George B. McMeans, Kaiser Steel Corporation, Fontana, Calif.; executive (presiding) chairman, J. T. Evans, Jr., National Supply Company, Torrance, Calif.; vice-chairman, Barney M. Dagan, Kaiser Steel Corporation, Fontana, Calif.; secretary, H. R. Brookman, United States Lime Products Corporation, Los Angeles, Calif.

Riverside Cement Co. Opens New Raw Grinding Facilities

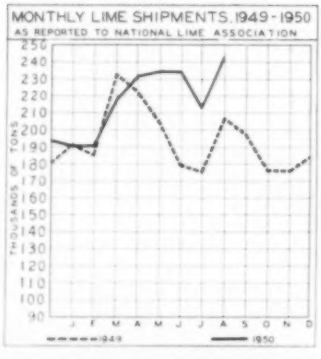
Capacity of the Riverside Cement Company, Oro Grande, Calif., will be increased by about 100,000 barrels a month by the addition of the firm's newly completed $1,000,000 raw grinding department. Total capacity is expected to be about 3,250,000 barrels per year.

According to Garner Beckett, president, the new facilities will require the employment of additional workers in most departments, especially the kiln room, the quarry, and the crushing department.

Canada Cement Predicts Record Output, Sales in '50

Canada Cement Company reports that all-time peaks in production and sales will be established in 1950. All of the firm's plants are operating at capacity. They are located in Exshaw, Alta., Fort Whyte, Man., Belleville, Port Colborne, and Ottawa, Ont., Hull, Que., and Montreal East, Que.

A proposed 700,000-barrel-per-year plant in New Brunswick is expected to increase the company's annual total capacity to 14,200,000 barrels—an increase of 40 percent over a five-year period.



According to data collected by the National Lime Association, 47 companies in August, 1950, shipped 240,309 tons of lime (145,269 quicklime; 95,040 hydrate). Reporting companies represent 59.4 per cent of the association members' total capacity of record. Based on Pit and Quarry's estimate for the remainder of the industry, the total shipments were approximately 445,000 tons. Shipments by uses and grades for August, 1950, were:

	Quicklime	Hydrate
Agricultural	5,298	11,912
Building	18,902	51,641
Chemical	121,069	31,487
Totals	145,269	95,040

J. J. Urschel, Pioneer Of Hydrated Lime Industry Dies after Long Illness

John Jacob Urschel, founder of the Woodville Lime Products Company at Woodville, O., died on October 27 at a Toledo hospital after an extended illness. He was 77 years of age.

Mr. Urschel spent his youth and early manhood on the farm of his father near Monclova, Lucas County, O. While a young man he became engaged in the lime business as a salesman for his uncle, who produced quicklime at Sugar Ridge, O. In August of 1901 he purchased the lime plant known as the Rancamp plant at Woodville, O., and organized the Woodville Lime Products Company. Here Mr. Urschel began the development of hydrated lime, as one of the pioneer producers of this material. Early in his career he recognized the superior qualities of the dolomitic lime he produced and was one of the first to develop the present-day finishing hydrated lime.

Due to Mr. Urschel's energy and enthusiasm the Woodville Lime Products Company grew into one of the largest plants of its kind, with 53 kilns and an annual production of over 100,000 tons of burned lime products. Through his efforts Woodville Lime Products was one of the first concerns to produce a hydrated lime product having a national distribution.

Shortly after he had developed finishing hydrated lime, Mr. Urschel organized the Urschel-Bates Bag Company, which had a license to furnish all of the lime bags to the lime industry. At his plant the valve bag packer was designed and put on the market. Later the firm name was changed to The Valve Bag Company of America. Mr. Urschel was a member of the board and was active in the management of the concern until it was purchased by the St. Regis Paper Company.

Throughout his life Mr. Urschel devoted his energies to the industry he had founded. For many years he was an active board member of the National Lime Association. In 1926 he helped to organize the Finishing Lime Association of Ohio.

At the time of his death Mr. Urschel was chairman of the board of the Woodville Lime Products Company, although the active management of the company had been entrusted to the capable hands of his son, George C. Urschel.

New Potash Trial Shafts Announced at Carlsbad, N. M.

Plans were recently completed and a contract was signed by the Southwest Potash Corporation with Winston Brothers of Minneapolis for the sinking of a trial shaft northeast of Carlsbad, N. M.

The Duval Sulphur and Potash Company has begun shaft sinking, and three other operations are already in progress. These are the mines of the International Minerals and Chemical Corporation, the Potash Company of America, and the United States Potash Company.

Kiln, Allied Equipment Ordered by Monarch In Plant Expansion Move

As a part of its modernization and improvement program, the Monarch Cement Company, Humboldt, Kan., has ordered a second 11- by 230-ft. kiln, an air-quenching clinker cooler, a coal pulverizer, a 26,000-lb. per hour boiler, and all the component parts. Installation of the kiln is expected to be completed by July 1, 1951.

In announcing the addition of this new equpment, President W. H. Wulf, stated that orders have also been placed for dust collectors in the raw mill, rock drier, and shale drier.

Construction work will be done by Jones Brothers Construction Company, Joplin, Mo., with boiler erection by Smiley Equipment and Construction Company, Kansas City, Mo. Dust controlling equipment will be supplied by the Northern Blower Company, Cleveland, O., and the Western Precipitation Corporation, Los Angeles, Calif.

Jamaican Bauxite Firms To Launch Expansion Plans

An announcement from Kingston, Jamaica, reveals that more than $22,000,000 has been allocated for bauxite development on the island.

Reynolds Jamaica Mines, Ltd., a subsidiary of Reynolds Metals Company, announced a $15,000,000 program for Jamaica last June. Financed by ECA loans, Reynolds Metals is developing a deep-water pier at Ocho Rios. A self-unloading ship now being built in England will transport the ore from this point to the firm's processing plant in the United States. A 13,000-ton shipment of bauxite will leave the pier every eight or nine days.

Jamaica Bauxites, Ltd., another firm which has announced plans for developing its holdings in Jamaica, has been granted a loan of $2,500,000 by ECA to finance the construction of an aluminum plant in Jamaica. This concern is a subsidiary of Aluminum, Ltd., of Montreal. Jamaica Bauxite does not propose to export raw bauxite ore but convert it into aluminum for export. Its new plant will be designed for an initial production of 100 tons per day, with provision for later expansion.

Big Arkansas Bauxite Plant Gives Free Performance

At Little Rock, Ark., the Reynolds Metals Company held open house at its Hurricane Creek bauxite plant for five hours one Sunday recently so that families of employees and other interested persons might watch the operation of the huge plant, said to be one of the largest of its kind in the country. An output of 4,000,000 lbs. of alumina, made from bauxite, is possible at peak production speed.

The plant was built as a defense plant in 1942 by the government at a cost of $42,000,000. It was leased by Reynolds in 1946 and purchased by the firm in 1949. More than 900 persons are employed at the plant.

Only Arkansas bauxite was processed in recent months, but for the next year and a half supplementary shipments will be received from Jamaica.

Georgia's Gov. Talmadge Attends Grit Plant Opening

Governor Talmadge of Georgia was the principal speaker at the formal opening of the Stone Mountain Grit Company's new $500,000 plant at Lithonia, Ga., on November 2.

The new facilities at Lithonia replace the company's original plant, which was destroyed by fire last May. Granite grit, the product of this operation, is distributed by the firm for poultry "supplement" throughout the United States. Heading the concern are Charles L., J. D. and N. A. Davidson.

Farms Take Big Helping Of Liming Materials in '49--More than 26,000,000 Tons

According to data supplied by the Agricultural Limestone Institute, a total of 26,301,349 tons of liming materials (all kinds) were consumed on farms in all states in 1949. Consumption of the various materials, according to geographical areas was as follows:

Northeast—2,000,934 tons, Pennsylvania leading with 1,020,272 tons.

East Central—2,739,794 tons.

North Central—17,817,057 tons, the following states credited with tonnages as listed: Ohio, 2,095,578; Indiana, 2,446,636; Missouri, 2,551,798; Iowa, 3,100,849; Illinois, 4,913,517.

Southern—1,459,423 tons.

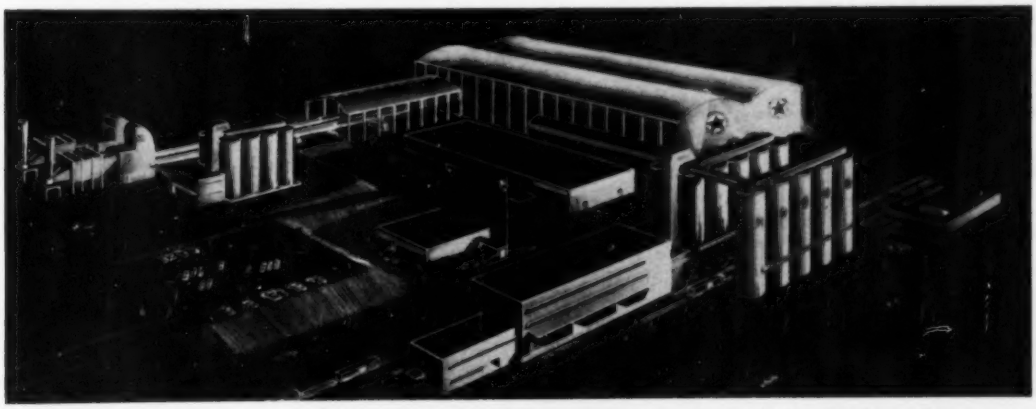
Western—1,146,828 tons, Kansas leading 1,028,249 tons.

Grand totals for the entire country stood as follows: agricultural limestone, 25,164,036 tons; burned lime, 120,705 tons; hydrated lime, 198,259 tons; marl, 520,363 tons; and miscellaneous materials (ground mollusk and egg shells, paper and sugar mill refuse, slag, lead mine chats, and carbide refuse), 297,986 tons.

International Minerals Plans To Process Uranium Ore

Development of Florida phosphate properties as sources of uranium was announced by Louis Ware, president of the International Minerals and Chemical Corporation, at the annual meeting in New York. Details of the operation are secret. However, Mr. Ware stated that work was being done for the Atomic Energy Commission.

The company also proposed an increase in stock from 800,000 to 2,000,000 shares. A portion of the stock increase will be sold to supply additional capital, and the balance will be distributed as a stock dividend. The new capital will be used for expanding operations and for establishing a laboratory near Chicago.



The accompanying illustration is the architect's sketch of the $6,000,000 plant now under construction for the Lone Star Cement Company near Roanoke, Va., which was described in our October issue (page 54). Left to right are the two 10- by 340-ft. kilns with their electrical precipitators and 100-ft. stacks, the eight slurry mixing silos, the storage building for limestone, shale, silica, clinker, etc., with the adjoining raw- and finish-mill building, the 15 cement storage silos, the packhouse and the big storage building. The office building is in the center, and the shops are at the extreme right. The layout of Lone Star's plant at Sweetwater, Texas, also under construction, is almost identical to that of the plant at Roanoke.

William S. Steele Heads Vermiculite Association Organized in New York

The Vermiculite Association, Inc., a New York non-profit research organization has been formed by leading independent miners and processors of vermiculite to increase and diffuse the knowledge and uses of vermiculite in widely diversified fields.

At a meeting held at Hotel Commodore, New York, on October 2, 1950, William S. Steele, president of American Vermiculite Corporation, was elected chairman of the board of directors of the association, with Henri R. Bastien, president of Vermiculite Insulating, Ltd., Montreal, Canada, as vice-chairman. Other directors are Robert L. Wilkerson, president of Southern Mineralite Co. Inc., New Orleans; Napoleon M. Bernier, president of California Stucco Products of N.E. Inc., Cambridge, Mass.; John A. Cawley, American Vermiculite Products Corporation, Newark, N. J.; William C. Marshall, vice-president of F. E. Schundler & Co., Inc., Long Island City, N. Y.; and John W. Lewellen Jr., Hyzer and Lewellen, Southampton, Pa.

William S. Elliott, an outstanding authority in the field of structural materials, has been named secretary-treasurer and engineering consultant of the association, with offices at 64-67 83rd Place, Rego Park, N. Y.

The association will concern itself with the geological formations available for exfoliating into vermiculite aggregates officers are considering the development of standard specifications for quality vermiculite aggregate to be used in connection with plans and specifications for buildings and structures where the product is most suitable.

The new organization will collaborate with the American Society for Testing Materials, the American Concrete Institute, and others in the development of specifications for the control and methods of application of vermiculite products.

"Own Your Own Trucks" Idea Catches On—Strike Ends

According to an item appearing in the November *News Letter* of the Missouri Limestone Producers Association, the purchase of two trucks broke a drivers' strike at the plant of Arthur and Jeannette Alvis near Butler, Mo. A couple of weeks of no deliveries, with the struck trucks lining the road, caused the owners to buy two carriers. The result was that the strikers returned to work one by one, and the strike was over.

Although the Alvises lost no large contracts because of the strike, and no violence or damage to equipment accompanied the work stoppage, the interlude of idleness came at a time when demand was high and delivery of thousands of tons of agricultural limestone and crushed rock had to be postponed. This is just another instance proving that producers should own or control their transportation and delivery services, even though more complicated bookkeeping and expense would be entailed. Using one's own vehicles would preclude most of the difficulties resulting from strikes such as the one at the Alvis plant.

Asphalt Plant at Buffalo To Turn Out 800 Tons Daily

Construction of a modern asphalt plant, capable of turning out 800 tons of binder and sheet asphalt a day has been completed and will be in operation within a month, at Buffalo, N. Y., according to George H. Kraus, president of Kendall Roadways, Inc.

Mr. Kraus stated that the plant will employ approximately 65 men when in full production. He added that he and a group of businessmen associated with him in the new venture plan to submit bids on street resurfacing projects in Buffalo.

Texas Operators Must Have Vehicle Licenses For Large Machinery

Several thousand pieces of heavy highway building equipment and other large vehicle machinery in Texas will have to get licenses and title papers at once.

A recent ruling by Price Daniel, attorney general, makes the heavy equipment subject to the same license and title requirements as other motor vehicles.

In the past the heavy equipment has been moved along public highways on special permits from the state highway department. Such equipment as rock crushers, draglines, road graders, concrete mixers, oil field equipment and some farm machinery are affected.

The office building of the Ross Sand and Gravel Company, Concordia, Kan., was recently enlarged to twice the size of the original structure.

80-Mile Road Trip Initiates Sturdy New Bucket Loader

Not long ago, Nelson Wagner and Gaillard Wagner, respectively father and son co-operators of the Wagner Stone Company at Pontiac, Ill., decided they needed a new bucket loader for handling aglime and road stone.

They selected one of the newly developed Barber-Greene Model 543 loaders. This machine has an overall height of only 12 ft. yet it can load into trucks over 11 ft. high by virtue of a hydraulically controlled trimming conveyor.

In order to facilitate its movement from pile to pile, or around a material yard, the B-G machine is also equipped with a 15-m.p.h. road speed. The Wagners decided to give this feature the acid test.

Accordingly, they showed up at the Barber-Greene factory and announced that they had come for their machine.

"Okay," said the shipping boss. "Where's your truck?"

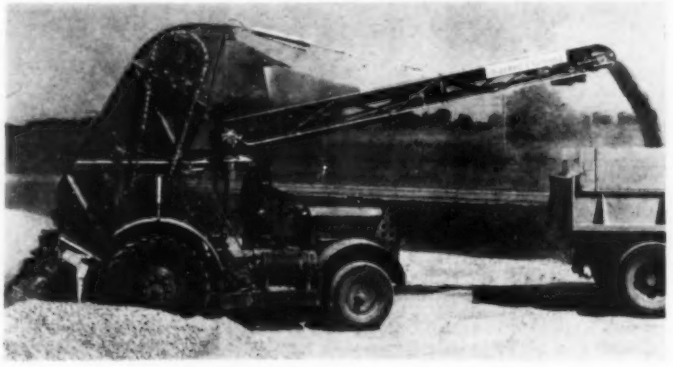
"We just brought the pick-up," replied the senior Mr. Wagner. "Gaillard's going to drive the 543 home; it's only 80 miles."

Surprisingly enough, the entire 80-mile trip was accomplished in 8 hours and 25 minutes, using 9 gallons of gasoline.

The Wagner Stone Company is located along U. S. Route No. 66, south of Pontiac on the farm of the elder Mr. Wagner. It has been operated by the father-and-son team since December, 1942. They daily produce up to 1,000 tons of agricultural limestone and road stone for several township and county highway departments in the vicinity.

Agstone is stored in a covered shed and is reclaimed by the bucket loader. The road stone is normally delivered to trucks by an overhead bin system. The loader is always at hand to load from an overflow stockpile when the lineup of trucks gets on the long side.

In addition to the B-G machine, the Wagners use 1¼-cu. yd. and ⅜-cu. yd. shovels in the quarry, a conveyor system partly Barber-Greene and partly of their own manufacture, one Diamond jaw crusher, and two Grundler hammermills.



• The loader at work at the Wagner Stone Company's plant near Pontiac, Ill.

Convention Program

Hotel Statler, Washington, D. C.

National Agricultural Limestone Assn. - Jan. 16-18

TUESDAY, JANUARY 16

10:00
PAN-AMERICAN ROOM
Board of Directors Meeting

WEDNESDAY, JANUARY 17

MORNING SESSION — 9:30
FEDERAL ROOM
Presiding—President Vincent H. Shea, president Hoosac Valley Lime Company, Adams, Mass.
Registration—Foyer of Federal Room
Call to Order and Welcome by the President
Presentation by Secretary of the Register of Members present in person or by proxy
Reading of minutes of previous meeting
Treasurer's report—N. G. Farber
Report of Committee Chairman
Finance—W. Ray Clark
Membership—Robert M. Patton
Legislative—John M. Deely
Percentage Depletion—Cale P. Haun
Executive Secretary's Report — Robert M. Koch
Announcement of new committees
Old Business
New Business

GREETING LUNCHEON — 12:30
SOUTH AMERICAN ROOM
Presiding—Director Barney T. Scharbach, vice-president, Sand & Stone Inc., Essexville, Mich.
"The Economic Situation"—Address by R. M. Evans, Member Board of Governors of the Federal Reserve System

AFTERNOON SESSION — 2:00
FEDERAL ROOM
Presiding—Robert Patton, assistant executive vice-president, Plum Run Stone Division, New York Coal Sales Company, Columbus, O.
Round Table Discussion on Operating problems
Round Table Discussion Participants—
William T. Doyle, president, Sturtevant Mill Company, Boston, Mass.
William A. Gibson, general manager, Bradley Pulverizer Company, Allentown, Pa.
David S. Gray, general sales manager, Baughman Manufacturing Company, Inc., Jerseyville, Ill.
C. L. Rosselot, general manager, Even Spread Company, Owensville, O.
Robert Wood, sales manager, Eagle Crusher Company, Inc., Galion, O.

4:15
FEDERAL ROOM
Report of Nominating Committee and Election of New Board Members

5:00
FEDERAL ROOM
Meeting of New Board of Directors

THURSDAY, JANUARY 18

MORNING SESSION — 10:00
FEDERAL ROOM
Presiding—Director Leonard Fry, president, Fry Coal & Stone Company, Mercersburg, Pa.
"Lime plus Fertilizer by Prescription"—Address by Les W. Hayes, president, L. W. Hayes, Inc., Kansas City, Mo.
Panel Discussion on Promotion and Its Effect on Sales
Panel Participants—
Bob Pleasant, Panel Leader
Burt Taylor
Lynn Stewart

LUNCHEON — 12:30
CONGRESSIONAL ROOM
Presiding—Director John M. Deely, president, Lee Lime Corporation, Lee, Mass.
"The Sky's the Limit"—Address by Dr. Tennyson Guyer

AFTERNOON SESSION — 2:30
SOUTH AMERICAN ROOM
Presiding—Director Earl Heckathorn, treasurer, Stuntz Yeoman Co., Inc., Delphi, Ind.
"Selective Service and Your Industry"—Address by Major General Lewis B. Hershey, Director, Selective Service
"For the Land's Sake Let's Protect It—For the Sake of Our Land"—Address by Harold K. Hill, assistant administrator for production, Production and Marketing Administration, U. S. Dept. of Agriculture

EVENING SESSION — 6:00
FEDERAL ROOM
Reception for Members and Guests

ANNUAL BANQUET — 7:00
CONGRESSIONAL ROOM
Presiding—President-Elect
"Lime and Our National Economy"—Address by Congressman George H. Christopher, representative from the Sixth Missouri District

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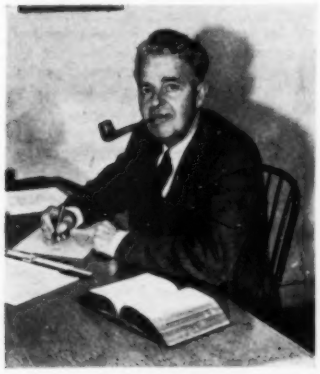
Death of Ralph E. Gibbs Loss to U.S. Lime Industry

It was with sincere regret that we learned of the death of Ralph E. Gibbs on October 10. Mr. Gibbs, who was a well-known consulting engineer in the lime and related industries, and a frequent contributor to PIT AND QUARRY, died unexpectedly of a cerebral hemorrhage.



Ralph E. Gibbs

In May of this year PIT AND QUARRY carried one of Mr. Gibbs's articles entitled *Nuisance Down Time Hurts Rotary Kiln Economy.* In July we published a discussion on *Loading the Rotary Kiln.*

Bulldozer Aids Professors In Archeological Research

Evacuating debris from ancient ruins near El Dragon, Peru, is this Allis-Chalmers HD-7 bulldozer. The Institute of Anthropology of the University of Trujillo has carried out several rewarding archeological investigations since it began operations two years ago.

Perhaps the most spectacular results have been at the great huaca known as El Dragon. More than 210 yards of continuous, elaborate relief work have been uncovered by the Allis-Chalmers tractor. It is believed that these mural decorations are the creations of an intermediary cultural group which succeeded the Mochica culture.

• Modern equipment uncovers ancient architectural relics in Peruvian earthmoving job.

It is said that White Sands National Monument in New Mexico is the world's largest field of pure gypsum. The snow-white dunes are moving eastward at the rate of several feet a year before the prevailing west winds.

• This huge machine went a half mile underground for "elevator" service.

Big Machine Goes to Pieces Before It Goes Underground

Not long ago the General Excavator Company, Marion, O., delivered to the Pittsburgh Plate Glass Company, Columbia Chemical Division, at Barberton, O., a specially-built crane-type machine destined for an unusual job. This crawler-mounted unit, a Model 310, was designed for use in Columbia's underground limestone mine, almost one-half mile straight down! The entrance shaft is 7 by 8 ft. No, the machine wouldn't go through! It was entirely dismantled and lowered, then reassembled in the mine.

In Columbia's search for salt deposits by drilling under Barberton (salt and limestone are major raw materials of the division) large deposits of limestone were found. That was the beginning of the underground limestone mining operation.

After a blast down under it is necessary for "scaler men" to remove loose rock and debris from the roofs and sides of the mine chamber. That is where the Model 310 comes in. At the end of its lattice-type boom is mounted an enclosed platform large enough to accommodate two scalers. The platform can be hoisted to a height of 46 ft. by the 52-ft. boom. A pantograph-type mounting keeps the platform level regardless of the angle of the boom. The machine travels from one location to another in the mine with its boom in a horizontal position, the independent swing and travel providing the maneuverability required to negotiate the turns through the 30-foot openings between the supporting stone pillars. A dolly is mounted under the end of the boom for easy travel on the mine floor. The boom hoist is operated by two units, the second being provided as an additional safety measure.

The 310's predecessor, a General Series I machine similarly equipped, which has been in use since 1928, will be rebuilt and used as a standby unit.

Canadian Cement Concerns Ship 15,000,000 Bbls. in 1949

Gross value of cement sold in Canada during 1949 (f.o.b. works) was listed by the Dominion Bureau of Statistics as $35,065,152, as compared with $30,561,717 in 1948.

Shipments by provinces during 1949 were as follows: Quebec, 6,901,192 bbls., valued at $13,722,635; Ontario, 4,599,322 bbls., valued at $9,155,613; Manitoba, 1,502,308 bbls., valued at $3,538,122; Alberta, 1,659,503 bbls., valued at $3,456,141; British Columbia, 1,254,239 bbls., valued at $3,029,425; all of Canada, 15,916,564 bbls., valued at $32,901,936. (These sales totals do not include the cost of containers.)

During 1949 1,721 employees in 8 plants received $4,754,611 in wages and salaries in the Dominion.

Zonolite Sales, Profits Up After Large-Scale Expansion

The Zonolite Company, located at Libby, Mont., one of the largest producers of vermiculite in the United States, reported net sales in the year ended March 31 of $4,653,356, an increase of more than 11 percent over the net sales figure for the previous year. Earnings for the 1949-50 period amounted to $645,888, as compared with $520,943 for the year just preceding this.

Zonolite invested nearly $500,000 in improvement and equipment during the 12-month period, bringing its expansion expenditures to $1,600,000 since the end of World War II.

Research Laboratory Installed by Marquette At Des Moines Plant

Recognizing the need for more active research studies in the development of improved products, additional items, and more efficient production, officials of the Marquette Cement Manufacturing Company are establishing a general research laboratory at the Des Moines, Ia., plant. The new facility will augment the work of the laboratories at other Marquette plants. It will be staffed by specialists operating under the general supervision of Technical Director C. E. Wuerpel.

C. E. Wuerpel

E. C. Hoeman

New personnel recently added to the Marquette staff for this purpose includes Charles U. Pierson Jr., formerly with the Portland Cement Association, who will be in charge of the laboratory as chief research assistant to Mr. Wuerpel; Erwin C. Hoeman, formerly on the technical staff of Battelle Memorial Institute, research chemist; and William E. Woody, graduate chemical engineer from Iowa State College, assistant research chemist. Other technicians will be added to this research team later on.

The new laboratory will function as a section of Marquette's Technical Department and will be located temporarily in remodeled quarters adjoining the existing plant laboratory at Des Moines. Plans for a new administration building to be built there later are being redesigned to include permanent quarters for this section. Equipment for chemical, microscropical and physical work in the realm of cement and cement manufacture is presently being installed at Des Moines.

Carbon Limestone Workers Get New Contract, Pay Hike

Operations were resumed at the Carbon Limestone Company, Hillsville, Pa., following the settlement of a six-week strike, by the United Mine Workers.

The 225 workers were given a 5-cents-an-hour raise and an old age pension of $100 a month, including social security payments at the age of 65, with 25 years of service.

Duval Texas Sulphur Company announces sales for the year ending September 30 of $3,976,667 as compared with $2,889,026 the previous year. Net income was $985,326 against $733,150 in 1949.

Nonmetallic Minerals Output in Canada On Rising Trend in 1949

According to preliminary figures, released by the Dominion Bureau of Statistics, the production of Canadian nonmetallic minerals firms in 1949 was valued at $777,900,000 at factory prices, an increase of 7.4 percent over the corresponding 1948 value—$724,100,000. While data for Newfoundland are included for the first time, it was the gain of almost $42,000,000 in the petroleum products industry which accounted for a large part of the increase.

In 1949 1,111 operating plants were open, distributed as follows: Ontario, 518; Quebec, 293; British Columbia, 79; Alberta, 68; Manitoba, 51; Saskatchewan, 35; Nova Scotia, 29; Newfoundland, 10; Prince Edward Island, 2; and the Northwest Territories, 1. The number of employees increased from 40,956 in 1948 to 42,543 in 1949, and the 1949 value of salaries rose to $103,800,000 from $93,500,000 in 1948. Materials cost $466,900,000 in 1949, and fuel and power, $48,000,000.

The following nonmetallic minerals industries showed gains in output values in 1949, as compared with 1948, while four showed declines. The percentage gains were as follows: asbestos products, 5.6; cement, 14.7; concrete products, 25.1; gypsum products, 10.7; lime, 6.5; salt, 13.6; and stone products, 27.8. Losses, percentagewise, were as follows: abrasive products, 17.3; sand-lime brick, 4.9; miscellaneous, 27.4.

Imports of nonmetallic minerals and their products totaled $535,000,000 in 1949, as compared with $606,000,000 in 1948. Exports of Canadian products in this field were appraised at $74,000,000 in 1949, as against $95,000,000 in the preceding year.

Cummins Research Engine Reveals Valuable Information

Twelve national and international racing records for automobiles are held by the Cummins Engine Company, Columbus, O., established in trials of a research engine developed from the "JBS-600" medium truck and bus engine.

Tests conducted at Bonneville Salt Flats established a world's record of 165.23 m.p.h., as against the old record of 158.87 m.p.h. Records were also established in the 5- and 10-mile tests and in the kilometer trials.

A result of the trials has been new information on weight reduction, increased speed and power, and higher speeds with improved combustion and freedom from smoke, according to J. C. Miller, manager-research and refinement for the company.

Home Ownership Experiment Initiated by Louisville Cement

Employees of the Louisville Cement Company at Speed, Ind., are currently participating in a home ownership experiment launched by the firm. One complete block of 18 houses was offered for sale to the employees who live in them, or to others who would like to own their homes. (Previously the cement company has owned all property in Speed, renting the houses to its employees.)

David Willingham, president of Louisville Cement, stated that if the experiment is successful, other blocks of homes will probably be put up for sale to employees.

National Gypsum's Baker Predicts Construction Decline

National Gypsum Company expects to clean up its backlog of unfilled orders by December 31, according to Melvin Baker, president. Reduction of building activities will reduce the present strong demand and allow the company to catch up, he stated.

Mr. Baker expects one-third fewer homes to be built next year in anticipation of defense production needs. During 1950 approximately 1,300,000 homes were built.

Link-Belt Company Loses J. S. Holl, Manager Of Advertising Since 1911

Julius S. Holl, advertising manager of the Link-Belt Company since 1911, died in November at a Chicago hospital. He was 64 years of age.

In 1905 Mr. Holl became associated with the J. M. Dodge Company, a subsidiary of Link-Belt, in Philadelphia. Six years later he was appointed to the post which he held until his death.

He was a past president of the Engineering Advertisers Association and a former vice-president of the National Industrial Advertisers Association.

For the 12 months ended September 30, 1950, Lawrence Portland Cement Company officials issued the following statistics: earnings per share, $3.828 ($3.259 in 1949); net sales, $8,087,-903.72 ($7,240,098.93 in 1949); net profit, $861,411.86 ($733,469.86 in 1949); shares outstanding 225,000.

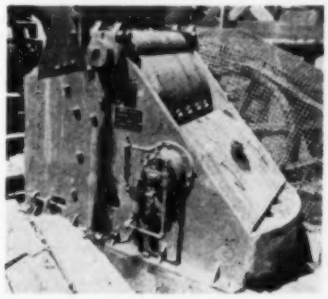
California Sand-Gravel Plant Uses Pipe as Chute Stand-In

A novel idea to reduce chute wear is in use at the plant of the Oaks Sand & Gravel Company, Redding, Calif.

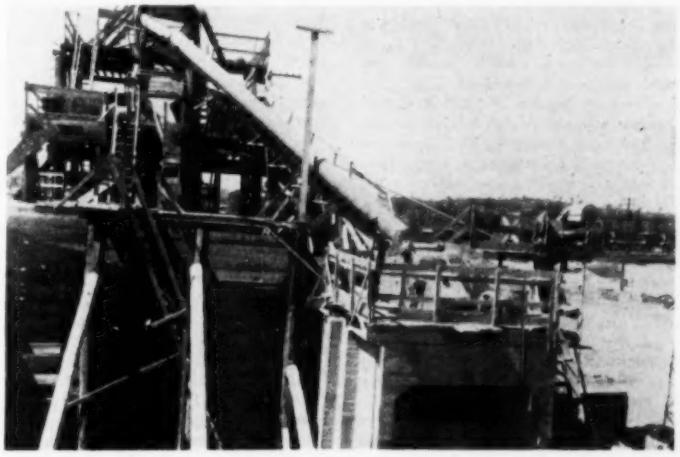
Processing a highly-abrasive type of river gravel, the company chutes oversize from a scalping screen at the top of the plant back to a lower level where reduction is accomplished by a Kue-Ken 36- by 12-in. Simplex jaw-crusher, followed by a Kue-Ken 18-in. Gyracone.

The long chute was subject to considerable wear and frequent replacement until it was removed and a long length of 18-in. pipe substituted for the conventional chute. This long cylinder is mounted on tight trunnions instead of being in fixed position. Every few days it is rotated a few degrees to equalize the wear over the entire inner surface. It has already outlasted two ordinary chutes with little sign of wear.

Late in the summer of 1950 the firm installed a Cottrell 20-in Whirlcone separator to recover fine sand in the minus 50-mesh range from the sand-drag tailings.



• The 36- by 12-in. jaw crusher at the Oaks Sand & Gravel plant is choke-fed by the pipeline chute.



• A long pipe chute, rotated every few days, cuts wear to the minimum at this plant.

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

THE editorial in the December, 1920, issue of PIT AND QUARRY had a strangely familiar ring. Apparently there had been some criticism of the rising cost of building materials, and the editor went to the defense of the nonmetallic minerals industries in this category. He pointed out that the increase in the cost of these materials was less than that of most others used in building and that practically 100 percent of this increase was due to increased freight rates, wages, cost of materials, etc. The real purpose of this editorial, however, was to protest the making of a cost study by the U. S. Office of Public Roads, based on a limited amount of information. Any study made, it was urged, should be extensive and exhaustive enough actually to indicate the true cost of production.

Another familar article was a preview of road building prospects for 1921. The Bureau of Public Roads estimated that about $550,000,000 would be spent on roads, a sum only slightly larger than the current rate of Federal-Aid contribution.

This issue contained a number of unusually important special articles. The staff-written articles included an illustrated treatise on tunnel blasting methods, advice on winter operation of pits and quarries, and a second article on the growing use of electricity in pits and quarries. Other articles had as subjects suggested methods of building chutes, how to get maximum efficiency from explosives, the advantages of institutional management for business, replies to criticisms of the proposed agricultural limestone law, and suggestions for more extensive agstone storage facilities for between-seasons production.

A list of the dates and places of coming conventions, state and national, was presented. The National Crushed Stone Association was to meet in Toronto, Ontario, February 8, 9 and 10, 1921. The National Association of Sand & Gravel Producers was scheduled for January 12, 13 and 14 at Louisville, Ky. There was also a report of a meeting at Waco, Tex., at which final steps were taken in the formation of the Texas Sand, Gravel & Crushed Stone Association. Officers elected were J. G. Strawn, Dallas, president; J. F. Morris, Gainesville, vice-president; Rhea Miller, Dallas, secretary-treasurer. E. Eikel was chairman of the transportation committee, and R. J. Potts headed the specifications committee.

Plant articles were confined to two, one describing the new plant of the Eaton-Kaster Company, Indianapolis, Ind., which was designed primarily for city service. There were no provisions for rail shipment, and the company owned a fleet of 5-ton trucks. The other article, a story in photos, described the plant of the Columbia Quarry Company at Krause, Ill.

Guthrie Bros. Washing Plant Opened at Milford, Iowa

One of the newest business ventures in the Milford, Ia., area is the gravel washing plant of the Guthrie Brothers (Glen and Bub). The new plant, a "Cedarapids" manufactured by the Iowa Manufacturing Company, in its first week of operation was rated at 200 tons of washed gravel per hour.

Water for the operation is obtained from the Little Sioux River, which the owners dammed at their plant site. The big electric pump supplies 900 g.p.m.

Newest industry of Superior, Wis., the Huron Portland Cement Company's plant, was scheduled for initial production in the immediate future, according to Superintendent C. T. Christianson. The new facilities will have a capacity of 2,500 bbls. of cement per 24-hr. day.

Production of cement rose 21 percent in Rumania during the first quarter of 1950. Other building materials were also up.

From the State Capitals

LOUISIANA—A state constitutional amendment which would have authorized issuance of $140,000,000 in highway bonds was defeated by Louisiana voters at the November 7 election.

A proposed state constitutional amendment which would have permitted the creation of a Sabine River Authority for development of the Texas-Louisiana boundary river was also defeated by Louisiana voters.

MICHIGAN—A state constitutional amendment authorizing the issuance of $65,000,000 in bonds for building mental and tuberculosis hospitals was overwhelmingly approved by Michigan voters in the November 7 election.

Because the amendment provided no means of amortizing the bond issue, the problem of financing will be up to the State Legislature.

MISSOURI—Clearing the way for Kansas City's proposed $2,500,000 underground parking garage, the Missouri Supreme Court has upheld the validity of the city's off-street parking ordinance.

Validity of the ordinance had been attacked by garage operators in a suit listed as John B. Bowman and others vs. Kansas City.

"It is well settled," the opinion declared, "that if it is in the public interest and for a public purpose, a city may be authorized by the state to engage in a business commonly carried on by a private enterprise; and in such case such city may levy a tax to support such business and compete with private interests engaged in like activity."

MINNESOTA—A proposed state constitutional amendment which would have broadened the split-up of state gasoline tax revenue was defeated by Minnesota voters at the November 7 election.

Two-thirds of the revenue now goes to improvement of state trunk highways, and the remaining third is allocated to counties for road work.

Under the rejected amendment, the allocations would have been changed so that the state would use 50 percent for trunk highway work and split up the rest between counties and the state's three major cities.

MONTANA—An appropriation of $2,000,000 from the 1951 Montana Legislature will be sought by the State Water Conservation Board for work in the biennium starting next July 1, it was decided at a meeting of the board and a special committee of the Montana Reclamation Association. The last Montana Legislature gave the board $1,955,000 for the two years ending next July 1.

NEW JERSEY—Preliminary cost estimates were exceeded by $8,556,646 by contracts totalling $110,147,964 which were awarded by the New Jersey Turnpike Authority up to September 30, according to the autority's quarterly report to bondholders.

Explaining it had anticipated the higher costs, the authority said that preliminary construction plans had been modified in many instances.

All basic construction contracts have been awarded with the exception of those for paving and for three structures, and bids on that work were scheduled to be received during November. The authority has obtained 112 miles of the 118 miles required for right of way.

OKLAHOMA—Preparations are being speeded for a start on construction of the Oklahoma City-Tulsa toll superhighway, according to an announcement made by J. Wiley Richardson, chairman of the Oklahoma Turnpike Authority.

Mr. Richardson stated that engineers are rushing detailed specifications for initial construction projects and that bid forms will be ready for the authority upon its return from New York. The authority then will advertise for bids for the first construction project on the superhighway.

RHODE ISLAND—A $12,000,000 bond issue for modernization and improvement of the state highway system was overwhelmingly approved by Rhode Island voters at the general election.

When lumped with federal and other state funds, the bond money will make possible a $40,000,000 highway building program in Rhode Island over the next seven years.

Report on Current Labor Developments

By S. HERBERT UNTERBERGER
Director of Research
Labor Relations Information Bureau
Washington, D. C.

another P-Q for exclusion

EMPLOYERS engaged in primarily local business have never been certain whether or not they are covered by the federal labor law. This situation has existed for over 15 years —ever since the National Labor Relations Act was passed. The Taft-Hartley Act did nothing to clear up the problem.

Many employers in the pit and quarry industries find themselves in precisely this situation. Their businesses are predominantly local in character. Their deposits, their processing plants, and most of their customers are all located within the boundaries of the same state. Nevertheless, occasionally they may buy some equipment or supplies from a firm outside the state, or they may sell to a firm which is obviously engaged in interstate commerce. It may be building an interstate highway or a public utility that crosses state lines.

Is this pit and quarry employer bound by the requirements of the National Labor Relations Act, and does he receive the protection of the Taft-Hartley Act? Up until very recently it has been impossible to answer this question with any degree of certainty. The rulings of the National Labor Relations Board were of no help in arriving at an answer. That board considered each case separately and on its own merits. As a result its rulings were frequently irreconcilable. A perfect illustration of this is found in two cases involving employers in or closely related to the pit and quarry industries. In the first, an employer who was engaged in the manufacture of concrete blocks, which were sold at wholesale to local building supply dealers, was found to be covered by the law. During one year he purchased raw materials, machinery, and equipment valued at approximately $270,000 of which $29,000 represented purchases from outside the state. In this case, the Board stated that "the close relationship between enterprises of this nature . . . and the building construction industry, over which we have recently asserted jurisdiction, logically compels the exercise of jurisdiction in the instant case".

More than nine months later in the second case an employer who manufactured or processed ready-mix concrete, sand, and gravel, all of which was sold to local construction contractors engaged chiefly in city paving and building construction was declared *not* to be covered by the law, despite the fact that in one year he bought $72,000 worth of cement outside the state. In making its decision the Board stated that it refused to exercise jurisdiction because this employer's operations were essentially local in character. Faced with this kind of inconsistency, it is no wonder that employers are thoroughly confused.

Only recently the National Labor Relations Board undertook to clarify the matter. In a series of eight decisions it promulgated a set of rules on the basis of which an employer can pretty well tell whether or not he is covered by the federal labor law. According to these rules, enterprises are covered if their dollar volume of business equals any of the following amounts:

(a) $25,000 on interstate sales.

(b) $50,000 in sales to customers who annually make individually at least $25,000 worth of interstate sales, or in sales to public utilities, transit companies or instrumentalities and channels of interstate or foreign commerce.

(c) $500,000 in direct interstate purchases.

(d) $1,000,000 in indirect interstate purchases.

(e) a combined dollar volume in any two or more of the above which, on a percentage basis, equals at least 100.

Several of the concepts used above require further explanation. "Instrumentalities and channels of interstate and foreign commerce" include radio broadcasters, telephone and telegraph companies, and other communication facilities. The difference between direct interstate purchases and indirect interstate purchases, is that in the former the firm receives the goods directly from outside the state and in the latter, it receives the goods from a supplier within the state who has received the goods from outside the state. Finally, the "combined dollar volume" criterion is likely to affect more firms than any other rule set forth. According to the N.L.R.B., here is how that will be applied. Suppose a firm ships $22,500 worth of goods out of the state. This is 90 percent of the $25,000 minimum amount. The volume of its interstate sales is not so great that the firm is covered by the law for that reason. Suppose, however, that the firm also purchases $75,000 worth of goods from outside the state. This is 15 percent of the minimum amount. Now the two percentages are added together, giving a total of 105 percent. Because this total is over 100 percent the firm is covered by the law subject to all its duties and privileges.

In addition, all public utilities, transit companies, and instrumentalities and channels of interstate or foreign commerce are covered, as well as establishments which are integral parts of multi-state enterprises, that is firms which have branches operating in several states. Finally, establishments whose operations substantially affect the national defense are covered. This last criterion permits the Board to take jurisdiction over firms that might have been exempt because of their low dollar volume of business. However, it is reasonable to expect that the Board, having set up rules for relieving themselves of jurisdiction over many firms, will not then turn around and increase its problems by asserting its jurisdictions over many local firms just because they happen to be engaged in the defense effort.

Employers who do mostly a local business would be wise to measure themselves against these rules. To be sure, many employers will learn that they are covered by the law. Now, for the first time, they can be sure about that.

Other Recent N.L.R.B. Actions

Before the passage of the Taft-Hartley Act only employers could be found guilty of discrimination. They could be ordered to reinstate an employee and reimburse him for any back pay he may have lost. Unions could require that an employee be discriminated against without fearing any penalties. The Taft-Hartley Act, however, made unions similarly liable if they were the cause of the discrimination.

Several recent cases illustrate the operation of this provision. In one an employer discharged an employee because the union insisted upon the discharge before it would sign a contract. Apparently the em-

(*Continued on page 65*)

The Use of Spherical Roller Bearings In Pit and Quarry Machinery

A discussion of the bases for bearing selection, the conditions calling for a self-aligning bearing, features and characteristics of spherical roller bearings, typical applications, mounting and dismounting procedures, the kinds of bearing failures and their prevention.

By JOHN A. TOTH
Chief Engineer
The Torrington Company

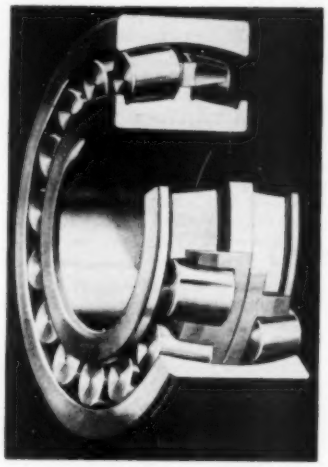


Fig. 1. A self-aligning spherical roller bearing.

BEARINGS are generally selected on the basis of their service life expectancy. This theoretical value is variously expressed: it is the number of revolutions or the number of hours at a given speed through which the bearing will operate under a given load before failure occurs "normally" through fatigue of the metal in the rollers or races.

Misalignment of machine components or deflection of bearing elements during operation can seriously alter the life expectancy of many types of bearings by concentrating excessive loads on a relatively small area of contact surface, accelerating the development of fatigue.

Designers of heavy-duty construction equipment have found that the self-aligning spherical roller bearing has definite advantages where (1) highly accurate initial alignment is difficult or impossible to secure, and (2) where anticipated load factors indicate that shaft deflection or frame distortion in operation will be in excess of limits tolerable for other types of bearings.

The spherical roller bearing affords high load capacity plus the assurance that the proper area of contact will be maintained under conditions of misalignment or deflection. Employing spherical contour rollers operating in a spherical outer race, this type of bearing (Figure 1) can accommodate approximately 3 degrees total misalignment without loss of capacity.

Design Features

The operating advantages of spherical roller bearings are secured through the design shown in Figure 2. The outer race is a section of a sphere with its center at the axis of rotation of the bearing. The contour of each roller is circular in transverse section with a slightly smaller radius than that of the outer race. The largest diameter of these rollers is located slightly inside the centerline of the roller. Under no load the roller theoretically makes point contact with the outer race at A. Under load this contact becomes an appreciable area, which is stressed to a lesser degree than the corresponding contact with the inner race, which has a contour radius the same as that of the roller. The large end of the roller bears against the center flange and has a convex surface generated to the related contour at the flange face.

The forces developed in the bearing under load provide a positive means of roller guidance. Force A acts in a plane normal to the surface of the roller where it makes point contact with the outer race. The contact between the inner race and the roller acts along the whole contact radius, and B represents its resultant. Forces A and B meet at a slight angle at E, and the resultant force holds the roller against the flange face at C, preventing the roller from skewing from its true rolling path.

The geometrical accuracy of spherical roller bearings assures proper distribution of radial and axial loads despite minor inaccuracies in initial alignment, distortion of machine frames, or deflection of shafts.

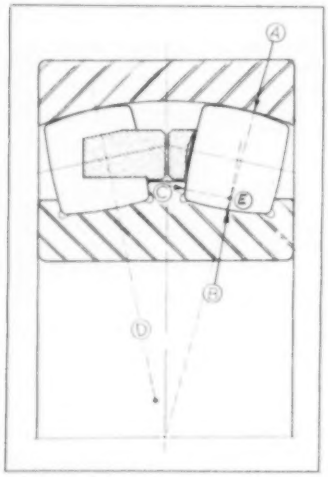


Fig. 2. Cross-section of a spherical roller bearing, showing direction of forces that provide positive roller guidance.

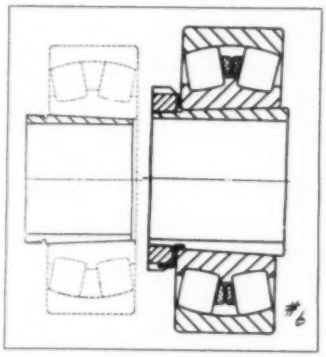


Fig. 3. (Left) Push-type tapered sleeve for mounting a tapered bore bearing on a straight shaft.

Fig. 4. (Right) Pull-type adapter assembly for mounting a tapered bore bearing.

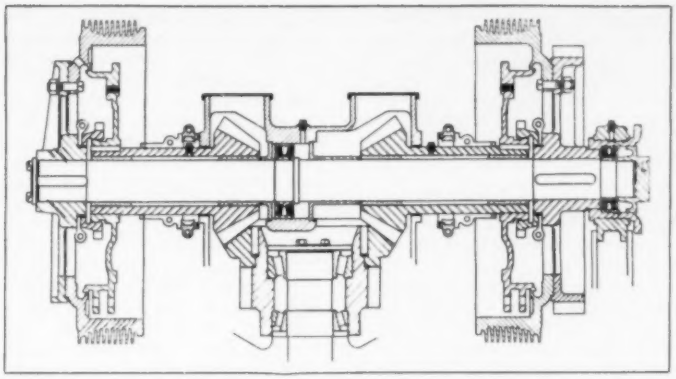


Fig. 5. Power shovel swing and traction shaft.

Machined bronze, land-riding separators maintain roller spacing, insure quiet operation, and minimize metal-to-metal friction. Outer flanges on the inner race serve only to retain the rollers when the inner assembly is turned out of the outer ring for inspection or cleaning.

The angular location of the rollers in relation to the bearing axis enables the spherical roller bearing to carry thrust loads in either direction. This feature provides a means for axial location of shafts.

In mounting, spherical roller bearings can be handled as self-contained units since the outer race is nonseparable.

Applications

In using this type of bearing, the expensive and difficult process of through-boring housings for bearings on a common shaft is not necessary. Where machines are built up from weldments, which is often the case with construction machinery, slight frame distortions resulting from the stresses set up by welding can be tolerated. Frame sections or shafts can often be lightened, since a certain amount of flexibility can be accommodated by the self-aligning feature of spherical roller bearings. Where bearings are mounted in opposed pillow blocks, the alignment factor in assembly is not so critical as with other types of bearings.

When spherical roller bearings are used, no other provision need be made to secure shafts against axial movement. A two-bearing mounting can have one fixed position and the opposite a free position, which will allow for shaft expansion and contraction with temperature changes and also will provide allowance for accumulated tolerances in assembly.

Figures 5 to 9 represent applications to construction machinery where spherical roller bearings have contributed to design simplicity, economy in fabrication and assembly, and more economical maintenance procedures when replacing machine elements.

Figure 5 shows an application to a power shovel swing and traction shaft. Bearings are some distance apart on centers and supported on separate welded structures. Initial alignment to the fraction of a degree required for a rigid bearing would be almost impossible to secure. Overhung loading also makes the application of spherical roller bearings advisable to compensate for shaft deflection in operation.

The eccentric shaft assembly of a vibrating screen (Figure 6) is another example where a relatively large bending moment in the shaft and frame can be anticipated as a normal condition of operation. The bearings are mounted some distance apart on pillow blocks supported on a welded frame. Concentricity of the housings for the eccentric bearings supporting the live screen load would be difficult to secure. Spherical roller bearings accommodate whatever misalignment may be present as an assembly factor.

Fig. 6. Vibrating screen eccentric shaft assembly.

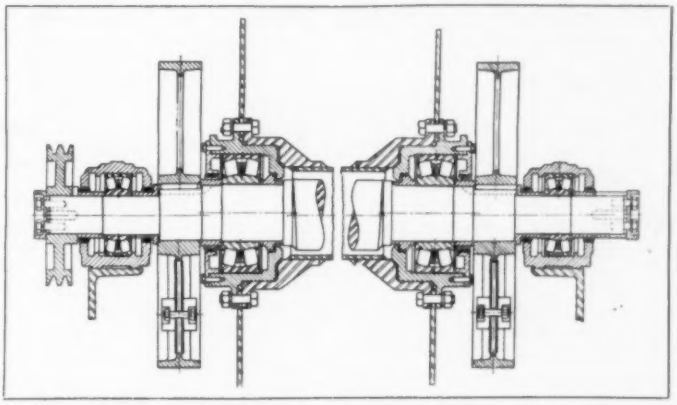
In the hydraulic torque converter shown in Figure 7 deflection of the output shaft, caused by overhung sprocket loads, is easily compensated for in the design shown. This construction permits the use of a right angle chain drive without an outboard bearing. The sprocket bearing is fixed against axial motion, while the opposite bearing is free to move axially in its housing, allowing for shaft expansion from temperature changes.

These examples and others shown in Figures 8 and 9 are representative of the many applications of spherical roller bearings to all types of construction machinery — power shovels, jaw crushers, roll crushers, hammermills, vibrating screens, aggregate plants, grading machines, conveyors and auxiliary drives and shaft mountings.

Mounting and Dismounting

Ease of assembly, disassembly, and maintenance is an important factor to be considered in the design of this type of equipment. Simplicity of design and ease of bearing removal will reduce the amount of down time necessary for bearing inspection or replacement.

Spherical roller bearings may be handled as self-contained units. The bearing is available with a straight bore or a tapered bore. The straight bore bearing may be mounted with a press or shrink fit to a straight shaft, and retained by lock nut and washer. Tapered bore bearings may be mounted to a straight shaft by the use of a tapered adapter sleeve, or directly to a tapered shaft. Use of a sleeve usually makes mounting and dismounting easier. Diameter tolerances of the shaft may also be increased, since the tapered sleeve



can be drawn up to make up the difference. Mounting on a tapered shaft, on the other hand, allows a larger shaft diameter and puts the responsibility for accuracy of fit on the machinist and the assembler. Internal running clearances may be accurately controlled by the amount of expansion of the inner race due to shaft interference fit, or by the amount the adapter sleeve is drawn up.

Adapter sleeves are of two types: the push type adapter sleeve (Figure 3) and the pull type adapter assembly (Figure 4). The selection of the method of mounting will depend upon the requirements of the assembly and the relative importance of ease of mounting and dismounting. A factor influencing design is the necessity of applying the mounting or dismounting force directly to the bearing ring that is given a press fit. This may be the inner or outer ring depending upon which is the revolving member in the application. Where possible, provision should be made for access with pulling tools to the back of the revolving member.

A relatively simple mounting to an overhead crane trolley (Figure 8) employs a one-piece housing with an end cover. Because the wheel is directly behind the housing, the bearing must be located in the housing at the same time it is being driven up on the shaft. Where only a light press fit is required, this arrangement is satisfactory, but some difficulty might be encountered if a heavy shrink fit required heating the bearing to expand the inner race.

To remove this bearing, removal tools may be applied to the flange of the inner race, unless the fit is so tight as to entail risk of damage to the flange. Otherwise, the removal force would have to be applied to the housing, which might easily cause indentation of the races through the transmission of force through the rollers to the inner race.

Despite the complexity of the assembly, this problem is avoided in the design shown in Figure 7. While disassembly would involve some difficulty, all bearings can readily be removed without risk of damage. The smaller bearing at the left is mounted on a pull-type tapered adapter, drawn up by a nut and lock washer. End clearance is left for the adapter under the spacer that locates the inner race. To remove the bearing, the nut is backed off a few turns, and the adapter is driven back on the shaft. This does not damage the rolling elements since the inner race is supported against axial movement by the spacer. Loose on the shaft, the bearing and adapter assembly can be readily removed.

In the same assembly, removal of the end plate on the right frees the bearing outer race. The entire shaft can then be withdrawn, the snap ring exerting force inside the inner bearing race to force the bearing from the housing. The large bearing at the left can also be removed by exerting force against the inner race.

In Figure 9, a mounting of an impeller breaker in a stone crusher, a one-piece housing with two end plates is used. The mounting sequence is simple: first the labyrinth seal ring is fixed to the shaft and the inner end plate slipped on. The bearing is then positioned and fixed to the shaft with the pull type adapter assembly. The housing is slipped over the outer ring of the bearing and the outer end plate and labyrinth seal is mounted. Dismounting is a simple reversal of this procedure.

With a tapered push type sleeve mounting, a nut is turned up on the threaded portion to bear against the inner race, forcing the sleeve out from under the bearing and relieving the interference fit.

When a bearing is mounted to a tapered shaft, the usual method of

Fig. 7. Hydraulic torque converter.

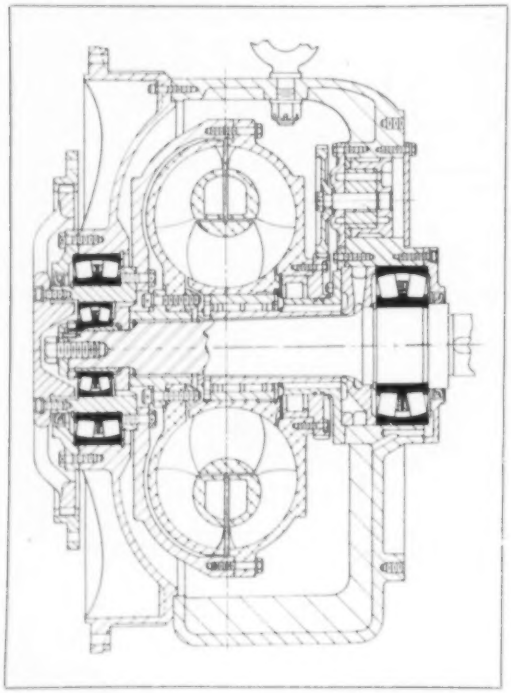
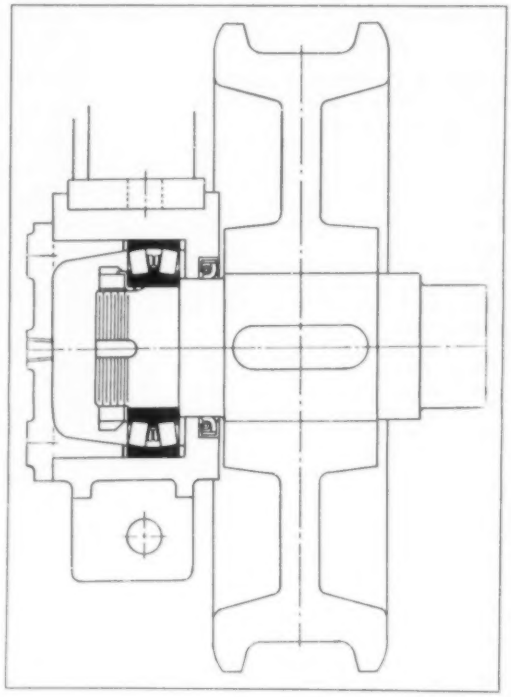


Fig. 8. Trolley wheel mounting for overhead crane.



removal with tools may be used. An alternative is the hydraulic method. The shaft is drilled to permit the introduction of hydraulic fluid under pressure into the area between the shaft and the inner race. This pressure is sufficient to expand the inner race enough for it to slip easily off the shaft. The procedure is applicable to both tapered and straight bore bearings with slight change in position of holes in the shaft.

Causes of Bearing Failure

Under ideal conditions a bearing will operate satisfactorily until the fatigue limit of the metal is reached at some point on the races of rollers —usually an area in the most highly stressed region of the outer race. At this point, fatigue cracking and flaking begins. Small cracks are formed, particles of metal flake off, and the affected area increases in size with continued use of the bearing, often taking on a pitted appearance. Whether such flaking is caused by normal loading over the expected life of the bearing or is a symptom of excessive loading can best be judged in terms of the individual application conditions and the service record of the bearing at the time of failure.

Fatigue is the "normal" cause of the bearing failure which is taken into consideration in life expectancy calculations. Several other factors influence bearing life and are considered to be preventable.

Provision against these conditions should be taken in designing the bearing installation, and maintenance procedures should include bearing inspection to detect symptoms of failure so that corrective steps can be taken.

Symptoms that can be detected without removing the bearing for visual inspection include noisy running, running hot, or contamination of the lubricant. These symptoms may indicate defects in the bearing, overlubrication or contamination by foreign material or moisture.

Causes of bearing failure include wear, creep, cracks and breaks, brinelling, false brinelling, corrosion, smearing, and pitting. It is important to distingiush among these types of failure so that the cause may be detected and the condition corrected.

In a properly lubricated and sealed bearing, wear is at the minimum under normal use. If the seal does not function properly, however, abrasive particles may enter and wear races, rollers, flanges and separators, altering internal clearances by lapping away metal. Lack

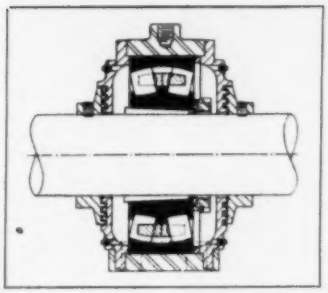


Fig. 9. Stone crusher impeller shaft mounting.

of lubricant or inadequate lubrication can also lead to wear owing to the rolling friction between rollers and races or the slight amount of sliding friction between rollers and flanges or cages.

Creep involves wear between a bearing race and the shaft or housing, and may give both the race and the shaft or housing a scored or polished appearance. This type of wear can often be reduced by good lubrication or by the use of proper fits between affected members.

Cracks and breaks in races, rollers or separators can easily be detected and may be the result of shock loading, an excessively tight fit of a race on a shaft, stresses set up by cocking the race when installing or removing it, the entrance of foreign matter that suddenly retards free bearing rotation, or an unknown subsurface defect in the metal.

Brinelling is the indentation of races by the rollers. It may be caused by improper application of the driving force in mounting or dismounting, so that the force goes through the rollers to the press-fitted race instead of being applied directly to the race. Hammer blows or sudden overloads can cause brinelling of the races.

False brinelling closely resembles brinelling, but has a completely different cause. If a bearing is subject to vibration when the bearing is not rotating, or if the bearing oscillates through a small arc, indentations may develop even though the bearing is carrying very little load. This type of failure is apparently a combination wear-and-corrosion phenomenon. It is difficult to eliminate but can be corrected if vibratory loading can be avoided when the bearing is stationary by increasing the amplitude of oscillation in an oscillating application and sometimes by the use of a compounded lubricant.

Corrosion of bearings results from the entrance of water or corrosive vapors or fluids into the bearing. Contaminated or poor-quality lubricants can also lead to corrosion. A special type of corrosion can occur between the bearing race and the the shaft or housing where sliding motions rub off particles so small that they oxidize almost instantly.

Smearing develops when two similar metals seize as they rub together. Smearing may be the result of rollers skewing from their normal rotating path, or being impeded from rotation by hardened lubricant or a foreign particle; or it may result from rubbing between the roller and an insufficiently lubricated race flange. Smearing can lead to rapid development of fatigue failure in the affected area.

Pitting is caused by an electrical current passing through the bearing elements. Stray currents may build up sufficient voltage to spark through the thin insulating film of lubricant between the roller and the race. The metal at that point is first annealed by the heat, then rapidly cooled and rehardened. A small crater may be formed, or the metal may be flaked off under stress. Heavy sparks may melt away metal, forming large craters in rollers or races.

Preventive Maintenance

This discussion of the causes of bearing failures clearly indicates the importance of adopting maintenance procedures that will help the machine user to secure the longest possible service from each bearing. Bearings should be inspected regularly, the interval determined from the severity of the service and the requirements for dependability of the application. Where damage occurs, correction of the trouble will increase the length of service of the replacement bearing.

It is essential in replacing spherical roller bearings that the replacement bearings be mounted with the diametrical clearance comparable to the original specifications.

Lubrication of bearings at proper intervals is another important maintenance procedure. Ordinarily high-speed installations should be lubricated more frequently than low-speed installations. The lubricant serves several vital purposes: it protects the polished operating surfaces of the bearing from corrosion; it contributes to the effectiveness of bearing seals; it acts as a coolant; and it lubricates the sliding surfaces between the operating parts.

The selection of lubricants is a critical factor in bearing perform-

(*Continued on page 65*)

• Among those present at the cement and quarry sessions of the National Safety Congress were (left to right): J. H. LeGore, Portland Cement Association; H. G. Collins, Lehigh Portland Cement Company; W. J. Scahill, Missouri Portland Cement Company; L. D. Cowling, Louisville Cement Corporation; Forrest Moyer, U. S. Bureau of Mines.

• This is another group whose attendance at the cement and quarry sessions helped to make it a success: O. L. Staggs, Lone Star Cement Corporation; Robert L. Moore, National Safety Council; Lee P. Warner Jr., The Warner Company, chairman of the cement and quarry section; Kent Jander, National Lime Association; T. W. Jones, New Haven Trap Rock Company.

13,000 conventioneers hear safety experts, view huge exposition at the —

38th National Safety

By E. R. JENNINGS, JR.

another ON THE SPOT report

WORRY first about the welfare of the individual, and the welfare of the group will take care of itself! With these words, Ned H. Dearborn, president of the National Safety Council, set the theme for the 38th annual National Safety Congress and Exposition, held October 16-20 in Chicago and attended by well over 13,000 representatives of every conceivable phase of American life. The various sessions were held in four of the Windy City's biggest hotels—the Stevens, Congress, LaSalle, and Morrison—in order to accommodate the 568 different speakers scheduled to bring home the various aspects of the vitally important idea of safety.

The exposition itself was greatly enlarged this year to bring together as comprehensive an array as possible of the latest developments in safety equipment. Both the lower lobby of the Stevens and the Casino Room of the Congress hotel were loaded with very effective exhibits of training aids, equipment, and means of making safety not just an ideal but a reality. Hundreds of trained technicians were on hand to demonstrate all phases of the latest in accident prevention, industrial health, and hygiene.

In his annual report, Mr. Dearborn pointed out that the concept of the dignity of man as an individual is equally true in the field of accident prevention as in world affairs. . . . "We want man dignified as a responsible, thinking person, and we want him blessed with physical health, he will then take his place in a safe and sane group life as an important entity. His welfare will determine the welfare of the group—not the reverse."

At the council meeting held on Monday, the general officers were elected for the current one-year term: Ned H. Dearborn was reinstated as president of the Council for the seventh consecutive year;

Ned H. Dearborn

Charles R. Cox, president of the Kennecott Copper Corporation, was chosen as chairman of the board of directors, while Guy L. Noble was retained as vice-chairman. The following vice-presidents were re-elected for another term: O. Gressens, finance and treasurer; E. W. Kempton, membership; Boyd Lewis, public relations; and T. R. MacDonald, traffic and transportation.

CEMENT AND QUARRY SECTION

Held on the afternoons of October 18 and 19, the cement and quarry sessions were very well attended, with those present showing an avid interest in the safety problems which are peculiar to these industries. In addition to members from all over the continental United States, there were guests present from South America and India. In order to personalize the various safety problems which exist, several discussion periods were held in conjunction with the regular talks. These proved quite successful, many interesting viewpoints and safety ideas being brought out in the process.

Chairman's Report Lea P. Warner, Jr., chairman of the Cement and Quarry Section, and personnel and safety manager of the Warner Company

of Philadelphia, started the ball rolling by stating in his annual report that, although membership in this section of the Safety Council had increased substantially during the last year, it was vitally important to continue active promotion of the safety idea and program among nonmembers and among those members who take an apathetic attitude towards safety.

He announced that during the coming year an even more extensive safety program will be followed in the cement and quarry industries. He reminded those present that H. G. Collins of the Lehigh Portland Cement Company will head the very important work of the visual aid committee and requested that throughout the year everyone keep

Congress

Mr. Collins informed on their safety methods and ideas by sending him information and photographs—anything which will demonstrate how individual safety problems were solved.

Safety in 1949 Forrest Moyer, chief, Accident Analysis Branch, U. S. Bureau of Mines, then gave detailed figures on the safety picture during the year 1949. He stated that for the third consecutive year, the overall safety record of the cement and quarry industries showed a definite improvement, 6 percent better than in 1948. It was the best record for the industry since the figures were first compiled in 1930. The greatest improvement was registered in the cement industry, with all phases of the cement and quarry section improving except sandstone, marble, and slate whose records were 3 to 17 percent worse than in 1948.

Mr. Moyer threw cold water on any possible complacency by emphasizing that although there was a reduction of 7 percent in total accidents, the fact still stands that in 1949, 6 out of every 100 employees in these industries were injured. He made it clear that there are still far too many accidents.

Material handling caused the greatest number of accidents, 19 per-

● And what convention story would be complete without a pretty girl's profile! (Sorry, phone number already spoken for.)

cent; falls were next, causing 17 percent; accidents around heavy machinery accounted for 15 percent—but were cited as causing the most serious injuries. Accidents around heavy machinery accounted for 1/5 of the total fatal accidents and over 1/2 of all the permanent injury accidents. Accidents caused by haulage equipment accounted for 14 percent of all accidents, but here again the injuries due to this cause represented a high percentage of the serious accidents, accounting for 1/3 of the total fatal, and 12 percent of the permanent injuries.

In a detailed survey undertaken last year of accidents in the cement and quarry industries, Mr. Moyer stated that only 38 percent of the industries studied were free from unsafe conditions, but that in general, housekeeping methods have definitely improved as plants are becoming more safety-conscious. He stressed that it is important to remember that this is not the time to rest on laurels, but to capitalize on these improvements to increase safety consciousness and vigorously to promote safety so that better records can be achieved in the future.

From this same study of the cement and quarry industries, it was found that unsafe acts were committed in 94 percent of the accidents last year. This is conclusive proof that "accidents" are not really "accidental" in the literal sense of the word, but have definite causes which could have been eliminated by a more rigorous attitude toward safety.

Some of the more common unsafe acts which caused accidents were discussed in detail by Mr. Moyer. They are as follows:

(1) Faulty job acts and wrong techniques were elements in 21 percent of all accidents, and were present as causes in 26 percent of the accidents around heavy machinery and haulage equipment, where the most serious accidents occurred.

(2) Working in unsafe positions was a prime factor in 19 percent of all accidents, and in 22 percent of the accidents around heavy machinery and haulage equipment.

(3) Unsafe posture or grip for the job accounted for 11 percent of all accidents, and was a factor of 7 percent in the heavy machinery and haulage equipment accidents.

(4) Failure to use personal pro-

Number of Injuries in Quarries and Nonmetal Mines in the United States, 1940-49, by Type of Material*

Year	Cement		Limestone		Lime		Marble		Granite	
	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal
1940	15	521	21	1,953	12	1,056	3	242	12	543
1941	14	705	30	2,622	17	1,551	.....	240	8	719
1942	46	787	30	2,530	12	1,342	2	171	14	531
1943	21	773	31	1,936	15	1,284	.....	137	5	403
1944	15	637	29	1,596	14	1,050	1	102	6	385
1945	9	600	24	1,381	8	961	2	104	7	396
1946	12	834	26	1,878	4	1,011	.....	173	5	493
1947	26	820	24	1,921	6	1,022	2	200	4	652
1948	24	786	26	1,703	9	931	1	167	6	590
1949	18	630	25	1,625	10	815	.....	220	3	535

	Traprock		Slate		Sandstone		Nonmetal Mines		Total	
	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal
1940	3	269	1	355	5	249	14	826	86	6,014
1941	4	361	1	323	2	349	17	1,182	93	8,052
1942	5	334	2	334	1	320	20	1,270	132	7,619
1943	4	254	.....	134	4	278	25	1,471	105	6,670
1944	3	228	3	146	2	293	17	1,283	90	5,720
1945	.....	195	.....	115	3	309	16	1,145	69	5,266
1946	3	221	2	181	3	346	26	1,369	81	6,506
1947	3	261	3	243	7	385	12	1,308	87	6,812
1948	4	257	3	188	2	372	15	1,176	90	6,170
1949	4	230	3	200	2	335	10	1,140	75	5,730

*Data for 1949 are preliminary.

tective equipment, such as goggles, safety shoes, helmets, etc., was a factor in 13 percent of all accidents. In these cases, either the workman had the equipment and did not bother to use it or else the equipment was not available in the first place.

Safety in Heavy Operations The next speaker on the program was Arthur R. Graham, supervising safety engineer, Chicago District, Bituminous Casualty Corporation. He delivered a very interesting and informative talk on *Safeguarding Heavy Operations* and illustrated his points with a fine movie taken at various cement plants all over the country. The cement industry has done much along the line of safety, even though conditions in a cement plant are by nature quite hazardous. Mr. Graham remarked that he was impressed with the ways in which many of these plants have beautified their grounds, and in general have attempted to give their workmen the feeling that the plant was "a nice place to work," going on the theory that a happy and contented worker is a safe worker. This idea has been borne out as a fact, because plants that have undertaken such programs have chalked up excellent safety records.

The film illustrated the methods which many cement plants have used to guard against accidents. Mr. Graham, in a brief discussion of the film, emphasized the importance of the use of strong, well-placed guards, mechanical unjamming devices, and automatic safety gates around crusher openings. He cited the many examples shown in the film of the use of heavily-constructed guards around danger points in heavy machinery, pointing out how such guards need never interfere with the operation and maintenance of such machinery.

Safety Consciousness Stanley M. Walker, mining engineer, U. S. Bureau of Mines, Washington, D. C., then spoke on the topic *Safety Consciousness—an Evaluation*. He made the observation that between 80 and 90 percent of all injuries can be traced to someone's lack of safety consciousness, often the injured person's.

"Safety consciousness may be defined," he explained, "as awareness of hazard and alertness to danger which controls every action of an individual through his desire to remain alive and uninjured."

"If the worker is to avoid injury," he said, "top officials must personally point the way. You can't buy safety, and lip-service to safety does not prevent injuries. Safety consciousness must be actively functioning from the highest-ranking official to the least skilled worker on the payroll, every day in the year, and every hour of the day."

New Officers The first thing on the agenda of Thursday's session was the election of the 1950-1951 Cement and Quarry Section executive committee.. All members of the 1949-50 committee were unanimously re-elected for another term in office. They are: general chairman, Lea P. Warner, Jr., The Warner Company, Philadelphia, Pa.; vice-chairman, M. C. M. Pollard, National Gypsum Company, Buffalo, N. Y.; secretary, Robert S. Boynton, National Lime Association, Washington, D. C.; *News Letter* editor, O. L. Staggs, Lone Star Cement Corporation, New York, N. Y.; engineering committee chairman, L. D. Cowling, Louisville Cement Corporation, Speed, Ind.; membership committee chairman, T. W. Jones, New Haven Trap Rock Company, New Haven Conn.; program committee chairman, Ivan LeGore, Portland Cement Association, Chicago, Ill.; statistics committee chairman, Forrest T. Moyer, U. S. Bureau of Mines, Washington, D. C.; visual aid committee chairman, H. G. Collins, Lehigh Portland Cement Company, Allentown, Pa.

Driver Training L. P. Struble Jr., general manager of the Keystone Division, Dravo Corporation, Pittsburgh, Pa., capably presented the subject of *Driver Training for Plant Vehicles*. Mr. Struble, illustrating his talk with slides, used as an example the method with which the Dravo Corporation indoctrinates its new ready-mix concrete truck drivers. He pictured the much-maligned truck driver as being, in reality, no different from any other employee.

To wind up his talk he told of the Dravo Corporation's perpetual driver safety contest, in which drivers are rewarded with cold cash for not having chargeable accidents. Whether or not the accident is chargeable to the driver's negligence is determined by a board made up of three drivers, one safety engineer, one insurance representative, a driver foreman, and the operating department chairman. Mr. Struble estimated that the program costs Dravo around $1,600 each year. However, in the last four years in which the contest has been run, there have been only two accidents of a serious character. He pointed out that this gets the idea of safe driving across to the drivers in terms of dollars and cents and, as a result, saves Dravo many thousands of dollars each year in lost time, prestige, customer dissatisfaction, etc.

• M. C. M. Pollard, of the National Gypsum Company presents Lea Warner Jr. with a plaque in recognition of his outstanding services as chairman of the Cement and Quarry Section during 1949-1950.

• This is Art Mathias, whose talk on safety committees proved to be not only informative but also extremely entertaining, as the expression on Mr. Warner's face testifies.

Safety Committee's Value

The next speaker, Art Mathias, Safety Coordinator of the Madison (Wisconsin) School System, delivered a talk which proved to be the highlight of both sessions. Mr. Mathias held the audience in the palm of his hand as he delivered an absorbing talk, liberally sprinkled with subtle humor, on the *Value and Functions of the Safety Committee*. He emphasized that the problem of safety is no single committee's function as many members of management seem to think; rather, it is something which, to be successful, must have the cooperation of everyone in the plant, from the president down to the floor sweeper. The real success of any safety committee is measured only by the extent to which its members are able to interest and absorb all employees in the principles of safety. He gave many hard-hitting examples of how safety committees, although organized with the best of intentions, can fail in their job. He touched again and again on the fact that no matter what type of safety program is decided upon, whether it is simple or complex, it will fail miserably if its basic premise is not to obtain the cooperation of all concerned. Mr. Mathias also cautioned against the indiscriminate use of authority in pushing the safety idea. The safety administrator must guard against crossing lines of authority in an organization.

MINING SECTION

In addition to the talks given at the cement and quarry sessions, two speakers who addressed the mining section came up with some information of interest to the pit and quarry industries. Frank R. Brophy, assistant general superintendent of the Universal Exploration Company, Jefferson City, Tenn., stated that his company has had marked success in using the diesel locomotive in underground mines.

"We are satisfied," he declared, "with the economy and safety of the operation of the diesel locomotive. We believe that no fire hazard of any moment is present, and a great improvement in mine ventilation will automatically result when diesel locomotives are installed underground and maintained in proper mechanical condition and with proper atmospheric conditions."

Joseph Bernhardt, superintendent of the No. 4 mine of the Bethlehem Cornwall Corporation, told the mining section that timbered slushing and haulage drifts rapidly are being replaced by concrete drifts, to the advantage of miner and owner.

Labor Developments

(*From page* 57)

ployer had gotten into trouble with the union when, as a member of the union's negotiating committee, he had expressed dissatisfaction with the negotiations and indicated that he wanted to resign from the union. The Board ordered the employee reinstated with back pay and required that the employer and the union jointly pay the back pay bill. A minority of the Board, including its chairman, thought that the union should be required to pay the whole back pay bill.

The union was required to pay the whole back pay bill in another case where the union caused the discharge of an employee because he failed to pay fines owing to the union. The Board ruled that even though there was a union shop contract in operation, the union could require only that an employee be discharged for failure to pay dues and initiation fees. It stated that fines were neither dues nor initiation fees. Not only was the union required to pay back the pay in this case, but was also required to pay the necessary back Social Security taxes.

Not only have unions been required to make restitution when their illegal acts have injured employees, but recently they have also been required to pay when their acts have injured employers. Thus in a recent case which was decided by the courts a union was found to be responsible for a walk-out in a plant where its agreement with the employer forbids lockouts by the employer, or walk-outs, sit-downs, slowdowns, or other interference with work by members of the union until the parties had complied with all of the steps in the agreed-upon grievance procedure. Nevertheless, without trying to settle the dispute through the grievance procedure, the union officials incited a walk-out. In this case, the employer was awarded a judgment of $33,000. This covered his fixed charges during the period in which the walk-out prevented him from operating his business.

Spherical Roller Bearings

(*From page* 61)

ance. Several points are taken into consideration in the choice of a lubricant—the housing design, operating temperature, speed, and any special requirements of the bearing type. The housing is designed according to the type of lubricant required for the application, so it is important that the proper lubricant be used according to whether the housing is designed for oil or grease.

If the installation is not exposed to moisture, or is exceptionally well sealed, a lime base grease may be used. Lime base greases are insoluble in water, so any moisture entering will corrode the bearing elements. At higher temperatures (above 40° C) this grease tends to disintegrate. Soda base greases form a rust-preventing emulsion with water, and should be used for equipment operated in damp locations. In the temperature range from 20° to 70° C, soda base greases afford good lubricating properties and protection against entrance of dirt.

As operating temperatures increase, viscosity of the lubricant should be increased. This factor often governs the choice betwen oil or grease as a lubricant.

As operating speeds increase, viscosity of the lubricant should be reduced. Greases are generally better than oil for applications involving low speeds. With high speeds, greases tend to churn, raising the operating temperature and losing their lubricating properties. A grease selected for high-speed operation should be able to stick to the bearing surfaces at high rotating speeds.

Lubrication is itself a special science, and qualified engineers should be consulted on special lubricating problems. There are many different types of greases and oils on the market today. Care in their selection and use will be repaid by increased bearing service life. The investment in bearings for heavy-duty machinery warrants the proper care and maintenance necessary for completely satisfactory service.

Cecil E. Rhodes Appointed To Asphalt Institute Post

Cecil E. Rhodes has been appointed a special projects district engineer of the Asphalt Institute, with offices in the Cobb-Stebbins Building, 1250 Stout Street, Denver, Colo. He succeeds Walter F. Winters, recently promoted to the post of chief engineer.

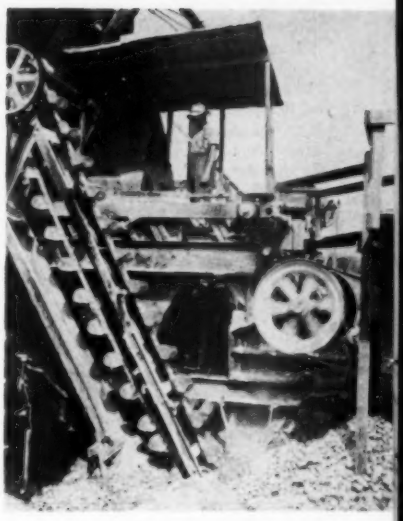
Mr. Rhodes will be in charge of special studies dealing with asphalt uses in developing the reclamation program, including canal, reservoir, and pond linings, dam facings, and erosion control.

Minnesota Mining and Manufacturing Company officials declared a year-end dividend of $1 on the common stock. This brings the year's total dividends to $3.20 a share as compared with $2.60 for the previous one.

Short on Glamour—Long on Performance

Wearing a "hard work" look, this Cary, Ill., sand-gravel plant does a fine job turning out washed products and road gravel.

By H. R. DRIMILLA



• The shaker screen, the jaw crusher, and the bucket elevator operate in closed circuit in the crushing stage at the Grove Gravel & Excavating Company's plant.

another ON THE SPOT report

COMBINING a single-crusher reduction stage with a thoroughly adequate semi-portable washing and sizing plant has resulted in a highly profitable enterprise for the Grove Gravel and Excavating Company, Inc., of Cary, Ill. The plant itself faces directly on the Northwest Highway (U. S. Route No. 14), gateway to the Greater Chicago area from that direction. The convenience of the location, with quick and easy access for direct delivery to consumer trucks, is an asset which the management wisely foresaw in the acquisition of the site and planning the construction of an installation most suited to accommodate the materials service needs of the environs. Hourly output amounts to 75 cu. yds. or about 110 to 115 tons.

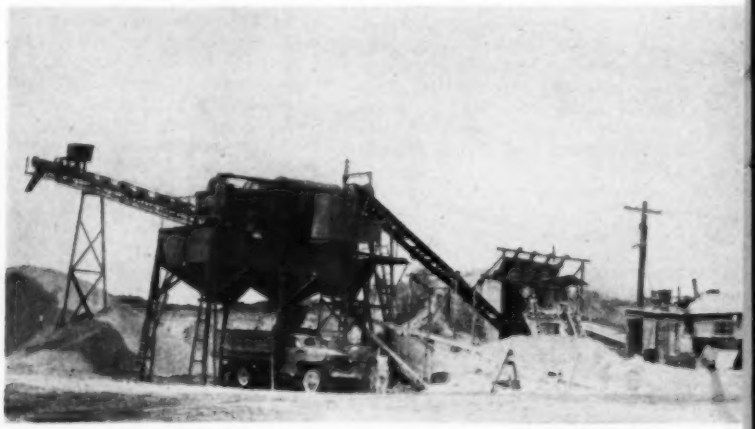
A total of 75 acres is encompassed by the company's property holdings, with the main pit fanning out behind the plant proper and another, referred to as the mason sand pit, since it is used as a supplemental source of sand for this purpose, across the highway. A clear water pond adjacent to the latter furnishes water for the wash plant. The two pits comprise about 57 acres.

Overburden, which averages about 5 feet in depth, provides an additional source of revenue, since it is stockpiled upon removal and sold to resort communities as fill for building in river lots, etc. Stripping is done with a Caterpiller D-7 tractor and a No. 70 10-cu. yd. scraper, which the company rents. At the main pit a Mead-Morrison dragline equipped with a ½-cu. yd. bucket assists in stripping, stockpiles, and loads the soil into trucks for delivery. A Caterpillar D-4 is used for clean-up, etc. An old Universal ⅜-cu. yd. shovel, powered by a Fordson gasoline engine, performs similarly at the mason sand area, this, however, in addition to the primary function of loading raw material for delivery to the plant. The shovel was purchased out of Detroit in 1928, having been in operation since that time, and is now regarded with affection by most members of the organization as a sort of mechanical mascot and useful relic of former days.

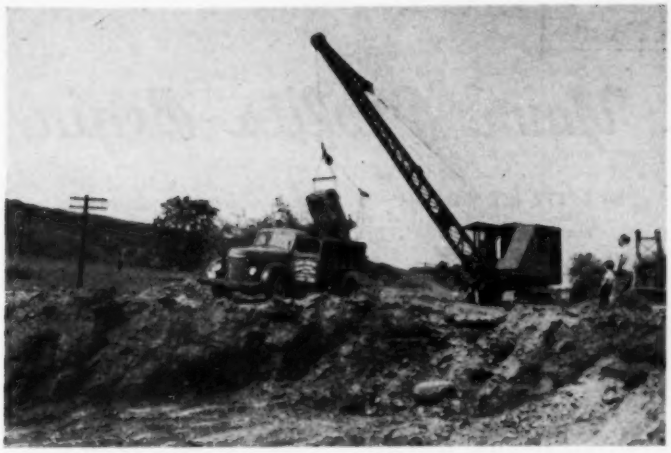
The face of the main pit rises to a height of approximately 50 ft. The company here follows a rather unusual practice in sand-and-gravel pit operation in that the face is benched at 25-ft. levels. This prevents damage from slides and also provides better working height for the Haiss portable loader which loads raw material into the trucks for delivery to the plant hopper. The length of the haul is somewhat more than ¼ mile over a gravel road.

Hauling distance from the mason sand pit is about ½ mile. There, the height of the face is about 60 ft. Plans are now under way to extend this another 30 ft. below water level. Under this arrangement sand will be piped into the plant by an

• Mr. and Mrs. Julian Dvorak, company vice-president and treasurer, respectively.



• A view of the washing and crushing stages at the Grove plant, Fox River Grove, Ill.



• Overburden is stripped to an average depth of 5 ft., using a tractor-scraper combination and this dragline, equipped with a ½-cu. yd. bucket, shown loading a customer's truck. Strippings are sold to resort communities as fill, etc.

• The portable loader loading raw material into a 10-cu. yd. rear-dump truck for delivery to the plant hopper.

• A closeup of the sand valve through which No. 1 sand is processed at the wash plant.

8-in. sand and gravel pump which will handle 120 cu. yds. per hour from a depth of 35 ft. with a total head of 65 ft. Naylor spiral pipe, 400 ft. of which has already been installed, will be used. The total length of pipe will be 1,200 ft.; it will run under the highway as it approaches the plant, where the sand will be dewatered. As working of the pit progresses, a booster pump will be needed to accommodate additional pipe length.

At present two available 6-wheel 10-cu. yd. rear-dump trucks do all the raw materials hauling. A 6-wheel International C-40 8-cu. yd. truck, equipped with a Thornton drive, is used as a standby.

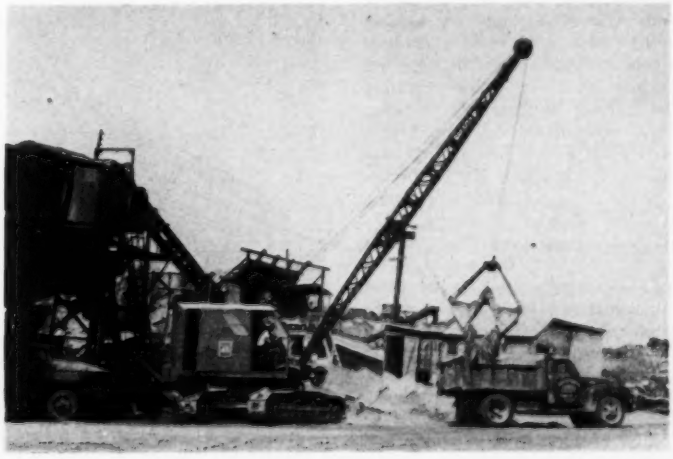
The trucks discharge into a 15-cu. yd. company-made hopper with rail gratings set at 8 in. This feeds a 2- by 8-ft. Symons single-deck shaker screen. Material passing through the 1¼-in. mesh is fed by a plate-type mechanical feeder to a 24-in. by 60-ft. Pioneer belt conveyor directly to the wash plant. Oversize is fed to a 10- by 20-in. Cedarapids jaw crusher which operates in closed circuit with a short bucket elevator feeding back to the screen. When road gravel is being run, it is routed off on a 14-in. by 35-ft. Cedarapids portable conveyor to a stockpile, from which it is loaded directly into trucks.

A Pioneer 305-W Continuflo semi-portable wash plant constitutes the washing stage. The feed conveyor discharges into a combination heavy-duty revolving screen and scrubber. The main drum is 42 in. in diameter and 21 ft. 8 in. long, with a 60-in. by 8-ft. sand jacket, 60-in. by 4-ft. rock jacket and 42-in. by 4-ft. scrubber.

Sizings ranging from ⅛ to ⅜ in. are chuted off on an 18-in. by 60-ft. stockpiling conveyor for open storage as No. 4 pea gravel, which

(*Continued on page 69*)

• The ¾-cu. yd. clamshell-equipped crawler crane loading No. 1 sand for delivery.



Know Your Break-Even Point—!

Where Your Profits Begin

By BETTY LEE GOUGH

Accounting Consultant

WHERE do you break even? What is the dollar sales figure below which you lose money? How much must you sell in order to realize a minimum profit objective which you have set?

These are questions which are becoming increasingly insistent in their demand for answers. Big corporations have always made a point of charting their break-even points, and using this information as a management guide. Today, with costs high, taxes high, and sales leveling off, many minerals producers find that they need the same information. When their sales level off, they find that for every dollar which yearly sales have increased, costs may have increased up to two dollars. The plain fact is that all businesses must take in more money simply in order to break even.

Minerals producers need to have a clear picture of the point where profits begin in order to make many management decisions. One producer, for example, may contemplate moving to a new, bigger site. The increased rent will run about 5 percent higher than previously. What will such an increase do to his profits? If his break-even point was formerly 61 percent of the year's volume, a fixed expense increase of this size may push the break-even point too high to afford a decent margin of business safety.

Only a knowledge of where the profits begin can help this minerals producer to make his decision —that, plus a clear idea of how much the move might be expected to increase his sales for offsetting the increase in fixed cost. Finding what accountants call the break-even point sounds like a fairly easy matter. But it is not. For the break-even point is no fixed proposition. It slides. If your volume is $100,000, the break-even point might stand at $70,000. If the sales go up to $120,000, the break-even point might soar to $100,000. Or it might jump only to $80,000. It might even stay the same.

Everything depends upon how much of your cost dollar is fixed, and how much varies with your volume of sales. Average, "industry" figures won't give an accurate answer. There are too many ways in which one company's operations differ from those of another. Local conditions contribute their share, too, toward making it necessary to find the point at which the individual firm's profits begin.

First, exactly what is the break-even point? The best definition is that the break-down point is the point at which your business makes a profit. Below that point it operates in the red. Above that point it operates in healthy black ink. Just where the break-even point falls depends upon many individual conditions, and not least important of these are the *variable* expenses and costs. These are the costs which force a higher break-even point whenever the volume increases.

If the average quarry had no sales in a given year, it would still have some costs, in the form of rent, minimum inventory, some wages, and other expenses which are "fixed." They remain the same regardless of the sales volume. But if that same quarry did a volume of $100,000 in the following year, then some of its expenses would be higher than the expenses which were incurred when there were no sales at all. Wages, for example, would probably be higher. There would be an increase in the cost of the inventory. Advertising undoubtedly would cost more. There would be higher freight, postage, and express costs. These expenses "vary" depending upon the volume of sales, and it is the variable expenses which produce the shifting break-even point.

• X marks the spot where profits begin.

Some expenses are partly fixed, and partly variable. Wages and salaries offer one example. Taxes, too, vary somewhat, although they are fixed in that there is usually a minimum basic tax paid for being in business.

There are three ways in which minerals producers commonly express their break-even points. One way is in dollars; a second is by percentages of the volume sales; and a third is by "month"; that is, at which month of the year the business has passed its expense point and is going ahead to rack up profits. Some producers say, "In August we will have paid our year's expenses. After that, we're on gravy." It doesn't matter how you choose to express the point at which the profits begin. Most businessmen like to put it in terms of percentage of the sales volume.

The first step in figuring a break-even point is to separate each expense item into classifications of "fixed", "variable", and "combination". Most minerals producers find that this calls for more than a quick glance. Some accounts which at first glance appear to fall into either the fixed or the variable groups actually are combination expenses. You may do a certain minimum amount of advertising — which is a fixed expense. But if you work on the accepted plan of allocating a percentage of the sales to advertising, then the advertising appropriation will probably increase past this minimum point if your sales are good. That makes it a combination expense. You may have a certain minimum number of employees. Their salaries are a fixed expense. If the receipts are good, however, the chances are you will need more help to handle the work, and so

the payroll, too, becomes an expense item which slides with the volume of sales.

Once you have separated the expense items into fixed, variable, and combination costs, the next step is to prepare a simple chart (see illustration). A pack of graph paper from the dime store—cost, five cents—plus a good pencil or fountain pen are all the materials you need. Drafting experience is not needed. As long as you can draw a line from one point to another, you can make a chart which indicates the break-even point for any given sales volume. It tells how much basic income is needed to break even, how much this increases as the variable cost accounts go up with the sales, and just where the profits begin to soar handsomely above the expenses.

The horizontal lines represent sales dollars. The vertical lines indicate the months (or weeks) of the year. A common practice is to have two scales across the bottom of the chart—that is, two vertical line indicators. One is for the basic purpose of charting months or weeks. The other, which is supplementary, represents percentage points which tell where the break-even point falls in terms of sales volume percent.

To find the break-even point for a year which has been completed, you first chart the path of the sales curve (using figures from your regular bookkeeping records) as it went up from month to month. Next, chart the path of the variable expenses; then combination expenses. Finally, draw a line for the fixed expenses.

When the sales curve first began to zoom above the lines representing the expenses was the break-even point for the completed year.

Every minerals producer sets a goal which he hopes to achieve each new year. From that goal, and the way in which it compares with the actual sales for the previous twelve-month period, it is fairly simple to project the probable path of the line which represents sales volume. The trend will be the same in all probability. It will differ only slightly, depending upon whether you expect the sales to increase or decrease.

From information furnished by charting the previous year's break-even point, it is simple to estimate lines for the fixed, combination, and variable expense items for the year ahead—remembering that these, too, will follow the general path of the previous year's curve, with slight changes which depend upon your expectations of increased or decreased volume and costs. Of what use is all this information to you? Let's take a case. Let us say that John Doakes plans a change in the method he uses to compensate his salesmen. The change will provide incentives for higher sales. It may also cost the company more payroll dollars. But in return, John Doakes expects to achieve an increase in his total sales. Will it pay him? Or will it force his break-even point so much higher that his expected increase would allow him neither a decent margin of business safety, nor a worthwhile increase in net profits?

Finding the present break-even point, and the break-even point which will be the new one if an increase in the combination expense of wages totals the 5 percent which John Doakes looks for, will give him a quick and accurate answer.

The real beauty of knowing where the profits begin is that it aids scientific management for profit. Some minerals producers tend to think only in terms of sales volume, and not in terms of how many sales dollars will be left at the end of the year in the form of solid net profit. Knowing the break-even point and the expenses which affect it permits more accurate planning in terms of profits.

Knowledge of the break-even point also helps the minerals producer who wants to know from month to month how his progress compares with his plans for the year. Is he making the profits expected, or is he skirting too close to the point where profits stop? The answer is found by knowing where the break-even point falls on the sales curve.

Whenever the question arises of a change in operating procedure, sales promotion expenditures, payrolls, leases, or any other item which costs dollars, the minerals producer who has a break-even chart can tell quickly how his decision will affect the all-important matter of net profit—or loss.

Short on Glamour

(*From page 67*)

product is also used as seal coat. Material to be processed as No. 2 sand passes through a double-chain paddle-type sand drag dehydrator, equipped with an inner setting chamber and an adjustable overflow weir. This feeds one of the two 21-cu. yd. capacity storage bins, both of which have double sliding gates to load the haulage trucks. The second bin is used to store No. 8 stone fed directly from the scrubber. No. 1 sand is processed in a Meckum Engineering sand valve, from which it is flumed to the stockpile. A Studebaker 6 by 6 Army surplus truck carries the No. 2 sand from the storage bin to the stockpile adjacent to the plant.

Water is pumped to the wash plant from the mason sand area, under the highway and up to the plant for a distance of 500 ft. with a 60-ft. head through 4-in. suction and 6-in. discharge pipe. Pumping is accomplished with a Fairbanks Morse 4-in. centrifugal pump powered by a 25-hp. electric motor of the same make.

The plant proper operates on 3-phase 440-v. electric power, transformer dropped from commercial lines and distributed through a Square D master switch. All motors have separate starters. A 20-hp. Wagner electric motor drives the shaker screen and crusher and a 25-hp. motor of the same make supplies power for the wash plant.

The company does not deliver finished product, but loads directly into the trucks of customers and suppliers. A Bay City crawler crane equipped with a ¾-cu. yd. clamshell bucket works the various stockpiles in carrying out this operation. Outgoing loads are weighed on a vehicular scale ramp located alongside the company office. The scale was supplied by the Howe Scale Company and is equipped with a Weightograph. Trucks travel from all directions within a radius of 30 miles to accept delivery at the plant.

A small but adequately stocked repair and maintenance shop is located between the office and the crushing stage. A mechanic is employed full time in the function of keeping the equipment in sound operating condition. Resurfacing work is done with a Wilson Hornet 375-amp. electric welder.

The company was founded in 1928, using the old Universal shovel to load out bank gravel on the highway side of the present mason sand pit. Production of road gravel with a 9- by 16-in. Austin-Western jaw crusher was begun in 1932. During World War II the firm added excavating work to its activities. The present crushing stage and surrounding site were acquired in the spring of 1948. The washing facilities went into operation early in 1949.

Edward Haseman is president; Julian Dvorak, vice-president; Cora Dvorak, treasurer; and Wanda Haseman, secretary.

Buffalo Slag's New Plant

By WILLIAM M. AVERY

another ON THE SPOT report

SEVERAL months ago The Buffalo Slag Company, Inc., of Buffalo, N. Y., materially bolstered its position as one of the world's foremost producers of processed slag with the completion of a fine new crushing and screening plant to operate in conjunction with the Lackawanna Plant of Bethlehem Steel Company. These new facilities were the subject of much favorable comment at the time of the mid-year meeting in Buffalo of the National Slag Association, during which the entire party was taken on a tour of plants in the area as guests of Buffalo Slag.

Easily the hit of the tour, the new No. 1 plant incorporates a number of features which are unique in the slag industry, or at least in that portion of the industry with which the writer is familiar. One of the outstanding features is the tremendous screening area which has been provided. In addition to a vibrating grizzly ahead of the primary crusher, there are 14 vibrating screens in the plant, with a total area of over 1,900 sq. ft. These include four 5- by 12-ft. double decks, four 5- by 14-ft. single decks, and six 5- by 14-ft. double decks.

The provision of a 7,500-ton surge pile area between the primary and secondary sides of the plant permits the two sides to be operated independently. Thus, when the pits are not operating for any reason, it is possible for crushing, screening, and loading operations to continue for a full day. Or, conversely, if the bins are full and cars are not immediately available, operations at the pit and at the primary crusher can continue without interruption. The average primary crusher feed is 420 t.p.h.

This new No. 1 plant, located in the Woodlawn sector of Lackawanna, will operate entirely on slag from the furnaces of The Bethlehem Steel Co. This material was formerly hauled at considerable expense to Buffalo's No. 2 plant in Lackawanna, which was also used to process slag from the Hanna Furnace Company and Republic Steel Corporation. The No. 2 plant now operates entirely on Hanna and Republic slag.

The No. 1 plant will eventually be supplied from three sizable pits, two of which are already in service. The third will be placed in operation next Spring. The pits are some 1,800 ft. long and approximately 40 ft. wide at the bottom. At the near end they are only about 150 ft. from the primary crusher.

Recovery operations start about two weeks after the last molten slag is dumped into a pit. The digging is done with a 4-cu. yd. Model 1400 diesel-electric P&H shovel which was purchased by the company just to serve the new plant. Raw slag is loaded into 15-ton quarry-type Euclid dump trucks for the relatively short haul to the primary crusher. These units (there are four of them in service) haul about 16 cu. yds. of material per trip, and loading time at the pits averages about 1¼ minutes.

Opposite page: This fine picture of Buffalo Slag Company's new processing plant at Woodlawn, N. Y., was taken before construction work on the secondary crushing plant had been completed. It shows clearly the relationship between the various units of the plant. Trucks from the pit dump their loads from the level area in front of the screening building.

Right: Four quarry-type end-dump trucks haul slag from the pits to the feed hoppers at the plant.

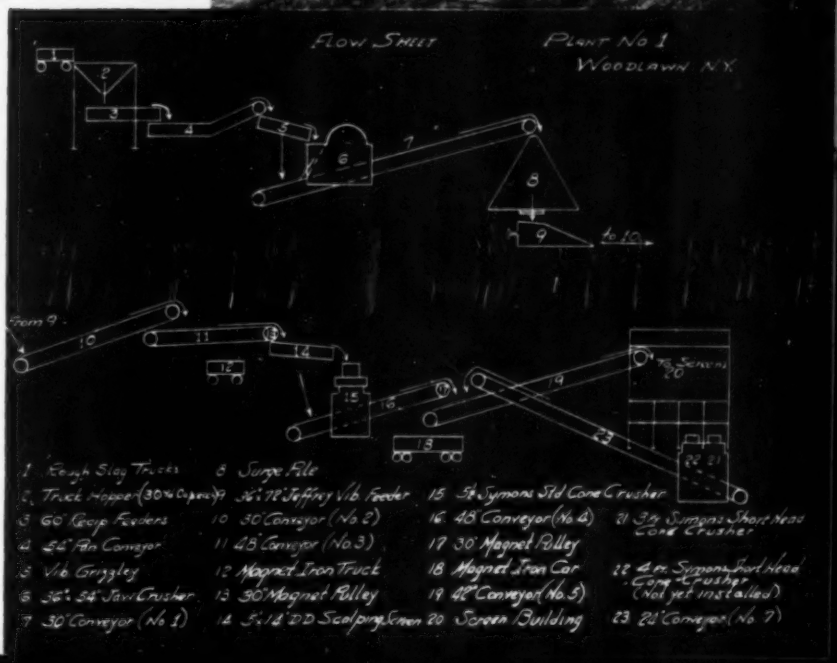
Below: This new 4-cu. yd. diesel-electric shovel was purchased for the new No. 1 plant. The screening building is visible just to the right of the dipper bucket.

Installation at Woodlawn, N. Y. Crushes, Screens at 300 t.p.h. Rate

An unusual feature of the dumping ramp adjacent to the primary crusher is that maneuvering space and hopper capacity have been provided to permit two trucks to discharge simultaneously. This precaution was taken to keep momentary delays at the crusher from being compounded by causing delays at the pit; and from our brief study of the operating cycle, we would say that it serves this purpose admirably.

The trucks dump into either of two steel hoppers from which the rough slag is fed onto a 54-in. pan conveyor by means of two 60-in. reciprocating feeders. These feeders are operated intermittently in order to control in some measure the rate of flow to the primary crusher. Two operators are stationed on a steel platform flanking the apron conveyor to control the rate of feed, to remove large pieces of metal, and to break up oversize pieces of slag with sledge hammers. The metal scraps are picked up periodically and conveyed to a railway car adjacent to the platform. This job is done with a Shepard-Niles electric hoist operating on a monorail above the platform. Skulls and very large pieces of metal are laid aside at the pit and are picked up there by a Bethlehem Steel crew.

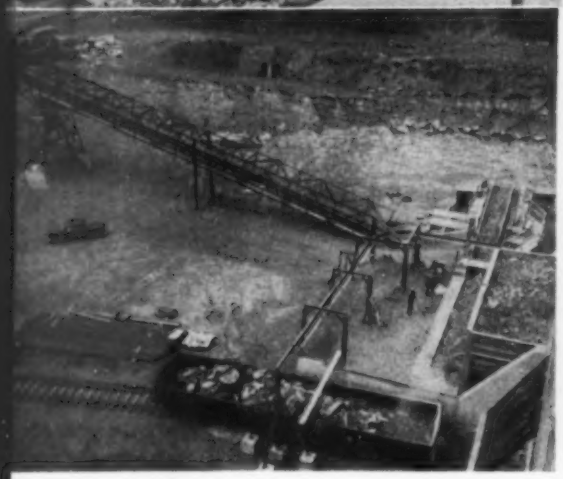
The 54-in. pan conveyor discharges over a Symons vibrating grizzly with 3-in. openings, the scalping operation at this point permitting about a third of the total flow to by-pass the primary crusher. The crusher, normally operated on a 6½-in. setting, is a


Flow Sheet
Plant No 1
Woodlawn N.Y.
1 Rough Slag Trucks
2 Truck Hopper (30 Yd Capacity)
3 60" Recip Feeders
4 54" Pan Conveyor
5 Vib Grizzley
6 36"x54" Jaw Crusher
7 30" Conveyor (No 1)
8 Surge File
9 36"x78" Jeffrey Vib Feeder
10 30" Conveyor (No 2)
11 48" Conveyor (No 3)
12 Magnet Iron Truck
13 30" Magnet Pulley
14 5'x14' DD Scalping Screen
15 54" Symons Std Cone Crusher
16 48" Conveyor (No 4)
17 30" Magnet Pulley
18 Magnet Iron Car
19 42" Conveyor (No 5)
20 Screen Building
21 3 Ft Symons Short Head Cone Crusher
22 4 Ft Symons Short Head Cone Crusher (Not yet installed)
23 24" Conveyor (No 7)

36- by 54-in. Birdsboro-Buchanan jaw. A unique feature of this crusher installation is the Farval system (see cut) which automatically lubricates all the bearings in the unit. The crushed material and the by-passed minus 3-in. are discharged onto a 30-in. inclined belt conveyor which delivers the material to the surge pile. Here, as mentioned earlier, about 7,500 tons of crushed material can be stored and used for feeding the secondary plant in the event of a shutdown at the pits.

Slag is recovered from the surge pile by means of a 30-in. tunnel belt conveyor which is fed by a 36- by 72-in. Jeffrey vibrating feeder. This conveyor discharges onto a 48-in. wide horizontal belt conveyor, where iron is hand picked and thrown into a chute which discharges it by gravity into a collection truck outside the building. The picking belt is equipped with a 30-in. diameter Dings magnetic head pulley for catching any iron that is missed in the hand-picking operation. Iron removed from the flow at this point drops into another chute which deposits it in an open-top railway car adjacent to the building.

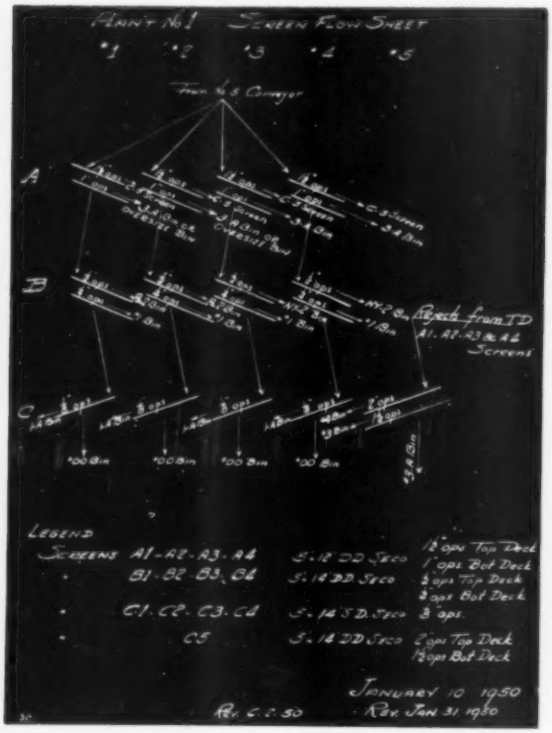
The 48-in. belt conveyor discharges onto a 5- by 14-ft. Seco double-deck Seco scalping screen where the flow is scalped at 1-in. to 3-in., depending upon demand. The rejects flow into a 5½-ft. Standard Symons cone crusher, and the two flows are rejoined on a 48-in. inclined belt conveyor which passes under the crusher. The head pulley of this conveyor is also a 30-in. diameter Dings magnetic unit, its function being to take out particles of iron which the crusher has freed from the slag. Iron removed at this



Above, left: Large pieces of metal are removed from the pan conveyor with an electric hoist.

Left: One of the 60-in. reciprocating feeders which discharges rough slag from the hoppers into the 54-in. pan conveyor.

Below, left: View from the screening building showing the primary section of the plant. Large fragments of metal are removed by hand from a pan conveyor and dumped into the car in the foreground.


Plant No. 1 Screen Flow Sheet
*1 *2 *3 *4 *5
From No. 5 Conveyor
A
B
C
Rejects from T.D. A1, A2, A3 & A4 Screens
Legend
Screens A1-A2-A3-A4 5'-14" DD Seco 2 Ops Top Deck 1 Ops Bot Deck
B1-B2-B3-B4 5'-14 DD Seco 2 Ops Top Deck 2 Ops Bot Deck
C1-C2-C3-C4 5'-14 SD Seco 2 Ops.
C5 5'-14 DD Seco 2 Ops Top Deck 1 Ops Bot Deck
January 10 1950
Rev. Jan 31 1950

location is chuted to the same car which receives the product of the first magnetic pulley. The entire flow of slag, now virtually free of iron, drops onto a 42-in. wide inclined belt conveyor which feeds the material to the top of the screen building.

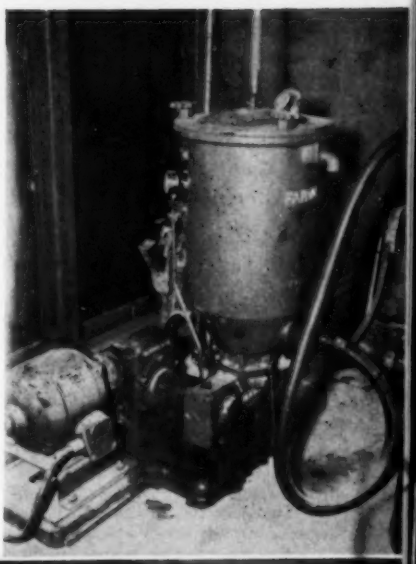
There are 13 Seco vibrating screens in the circuit, arranged in banks of 4 screens each on the two upper levels of the plant, and one bank of five screens on the first level. On the top level, which is designated as "A" in plant nomenclature, the four 5- by 12-ft. double deck units all have 1½-in. openings in the top decks and 1-in. openings in the bottom decks. The conveyor which feeds this battery of screens discharges into a series of divider boxes which split the flow into four parts for feeding the four screens. These splitter boxes are so arranged that any one bank of screens, or any combination of banks of screens, can be operated independently.

On the "B" (or intermediate) level of the building there are four 5- by 14-ft. double-deck screens, all having ½-in. openings in the top decks and ¼-in. in the bottom decks. Directly below these is the "C" battery, consisting of four 5- by 14-ft. single deck screens, and one 5-by-14-ft. double-deck. The single-deck units have ⅛-in. openings. The double-deck screen, No. C-5, has 2-in. openings on the top deck and 1½-in. openings on the bottom deck. The screens on the two upper levels of the plant are numbered from one to four, and on the lower level from one to five, so that a particular screen is fully identified by a letter (A, B, or C, indicating the level, and by a number.

The flow through this somewhat complex circuit is normally as follows: The rejects from the top decks of all A series screens are delivered to the double-deck screen on the lower level, which is designated as C-5. The three products from this screen go directly into the bins. The rejects from the bottom decks of A

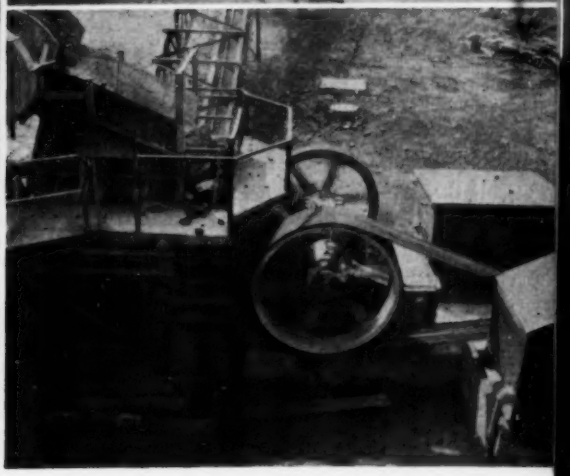
(*Cont. on page 77*)

Crusher bearings are protected by this fully-automatic lubrication system.

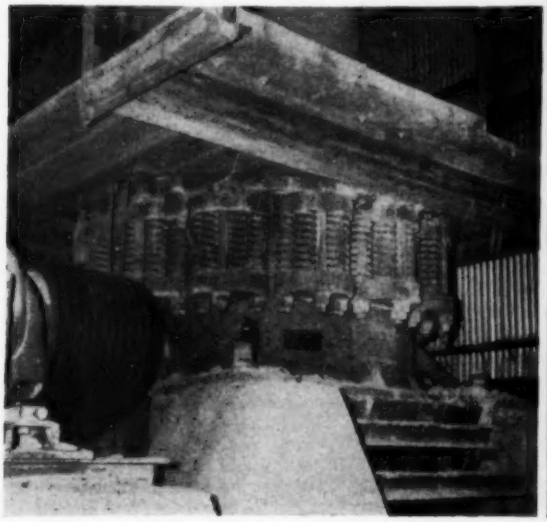


Right: View of the 5- by 12-ft. double-deck vibrating screens on the top level of the plant. There are four identical screens in this battery.

Below, right: View of the 36- by 54-in. jaw crusher. The rough slag passes over a vibrating grizzly which takes out minus 4-in. material ahead of the crusher.



Below: Secondary crushing of slag from the surge pile is done with this 5½-ft. standard cone crusher.



WASHINGTON NEWS LETTER

War Comes to the Construction Industry

By S. HERBERT UNTERBERGER

another P-Q first exclusive

THUS far the remobilization program has probably hit the construction industry harder than any other industry in the United States. First, home construction was hit a telling blow in its most vulnerable spot, the mortgage market. There was no secret about the purpose of this action. In 1950 approximately 1,300,000 new homes have been built. By 1952 the government expects to have this number reduced to 800,000 or less. This is a 40 percent cut.

How does the government expect to accomplish this? The method is quite simple. The home building boom was a direct result of the government guaranteeing and insuring loans on easy terms. The government is simply withdrawing a part of its bounty. The net effect is that a much greater down payment is now required to buy a new house, and the monthly charges are generally higher.

Formerly a veteran could buy a $7,000 house for nothing down and about $34 a month for 30 years. Now he has to put down $500, and he has only 25 years to pay off the mortgage. A non-veteran could have bought this same house for $350 down and 30 years to pay off the rest. Now he must put down $1,200, and he has only 25 years to pay off the mortgage. $500 in hard cash is a lot of money for an ex-G.I. who has been out of service only a short while and is trying to do everything at once—build up his career, raise a family, and catch up on the lost years. $1,200 down may prove to be prohibitive for buyers in the $7,000 house market.

Actually a $7,000 house is almost a rarity. Realistically speaking, an $11,000 house is about the cheapest you can get. Washington's recent regulations have put this out of the reach of a very high proportion of the potential buyers. A few months ago a veteran would have had to make no down payment for such a house. It would have cost him about $52.50 a month for 30 years. He now needs $1,600 in cash, and it will cost him about $57 a month for 20 years. A non-veteran now needs $2,700 in cash to buy this house. The more expensive the house, the tougher they make it. A $25,000 house now requires that veterans and non-veterans put up about 50 percent in cash.

Right on the heels of that regulation came the ban on non-essential commercial construction. Some 45 types of buildings, from country clubs to theaters, could no longer be begun after October 26. As a result of local protests by the construction industry, there was a slight relaxation of the original order, but in the long run it won't mean very much. Penalties for violation of this order run high—$10,000 or a year in prison, or both.

Nor is this the end. Orders are now in the making regarding the construction of stores, office buildings, and factories.

Why has the government singled out the construction industry for such early and drastic action? Actually the construction industry has not been singled out; but it did happen to be one of the places where results could be achieved most easily. The home building industry relied completely on the government. Other types of construction, too, were heavily dependent on government loans or guarantees. By merely changing the terms of the loans or guarantees the government could get results quickly. No new legislation was required. It was not necessary to wait for Congress; nor was it necessary to explain its action to anybody.

Furthermore, the government accomplished many of its other purposes by slowing down new construction. The construction industry uses a great many strategic materials, not only in the actual building of a structure, but also in the fixtures and appointments that go into it. If home building drops by 40 percent of the production, plumbing fixtures, hardware, and other items will fall off by at least as much.

There is one other point here. Studies on the subject show that most household appliances are bought by new households. Fewer new households means that the production of household appliances will fall substantially.

Although the construction industry was one of the first places where the remobilization program has struck, it is certainly not the last place that will feel its effect.

Credit Controls

Already the effect of the new controls on consumer credit promulgated by the Federal Reserve Board is making itself felt. Before September 18 a $2,000 automobile could be bought for $500 down and $49 a month for 36 months. Now it requires $667 down and $96 a month for 15 months. Here it is the increase in the monthly payment resulting from the reduction in the period of payment which is making automobile purchases prohibitive for many persons.

The situation for refrigerators, television sets and other consumer durable goods is not very different. Reports are beginning to come in from all over the country showing that these items are piling up on the dealer's shelves and in his warehouses. There is a real possibility that production of such goods will have to be slowed down.

Of course, that is precisely why the regulations were issued. Government officials in charge of these matters are thoroughly convinced that the materials and manpower previously going into these items will be needed very shortly to produce defense items when the government program goes into high gear.

The expectation is that just about the time production of these items really slows down, defense orders will come along and take up any slack. It would be remarkable if the program worked with such precision everywhere. No doubt, there will be some hardships for businessmen and workers in many places while they wait for the defense program to catch up with them.

Moreover, we have not seen the end of the credit control program. It is known that the Federal Reserve Board has for a long time been considering increasing further the reserve requirements for member banks. It hopes that if a bank has more of its reserves frozen, it will be less inclined to extend loans to customers. The Federal Reserve Board also would like to see interest rates rise. A rise in the interest rate would of course, put a further damper on loans. Under considera-

(*Continued on page* 88)

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New Permanente Plant Solves a Tough Problem

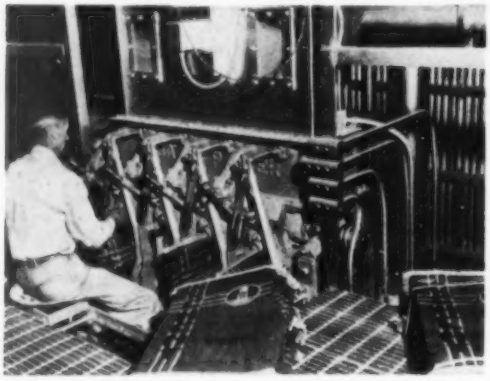
CONSTRUCTION activity of all kinds has increased to a rapid tempo in Alaska, but the current boom has brought many headaches to the Alaskan builders. Materials must be transported hundreds of miles by boat, rail, or air, and prices have been sky-high. Recently the Permanente Cement Company established its new cement distribution plant at Anchorage, Alaska, a move that promises to ease at least one of these building bottlenecks.

Built to serve Alaska's rail belt area and the city of Fairbanks, the new plant has a bulk storage capacity of 30,000 bbls. of cement contained in two 15,000-barrel steel storage tanks. Bulk cement has been made available to Alaskan builders for the first time in territorial history.

Because bulk cement is easier to transport, it should effect a reduction in building costs, and will mean a more efficient job for batch plant operators. It will also mean the end of high losses often caused by sack breakage during shipment. Now the cement is sacked at the Anchorage plant by machines with a capacity of 32 bags per minute.

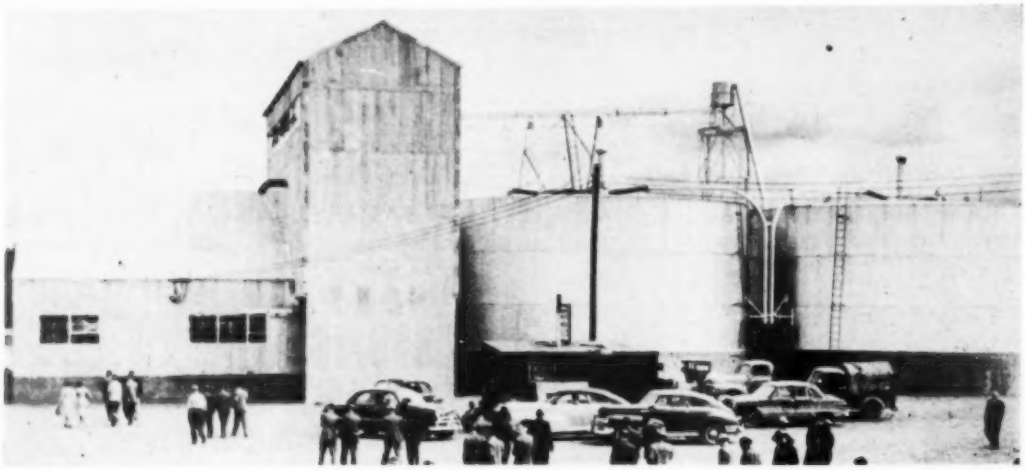
Cement delivery to Alaska is made from Permanente's Seattle distribution plant in 15,000-bbl. capacity barges (converted LSTs), towed by the Foss Tug and Barge Company. They are unloaded at the Anchorage plant by portable Fuller-Kinyon pneumatic pumps which transfer the cement from the holds to the shoreside silos in a matter of a few hours. The Seattle plant is supplied with cement from Permanente's plant at Los Altos, Calif. The company-operated *S.S. Permanente Silverbow*, a 10,000 ton ex-Victory ship, transports the cement to Seattle in 58,000-bbl. loads.

In order better to serve the rapidly-growing Fairbanks area, Permanente is currently building a distribution plant there. Cement will be shipped to this new plant by rail from Anchorage, and then delivered to private and military builders by truck. Tom Davis is plant superintendent at Anchorage, and the Morrison-Knudsen Company were the builders.

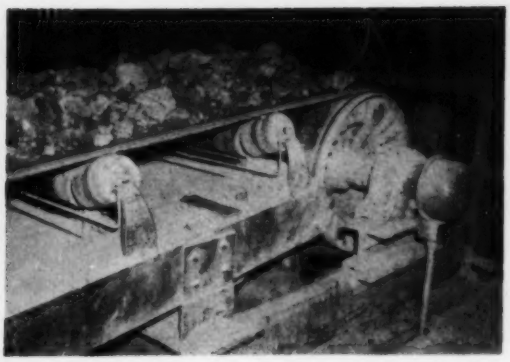


• A closeup of the sacking machinery, with Tom Davis, plant superintendent, at the controls.

• Here the first truckload of bagged cement is loaded for delivery to the Alaska Concrete Products Company.



• Scene at the opening of the Permanente Cement Company's new Anchorage, Alaska, cement distribution plant. The 15,000-bbl. steel storage tanks are at the right, the packhouse at the left.



Above: One of the two 30-in. diameter magnetic pulleys which remove particles of iron from the slag.

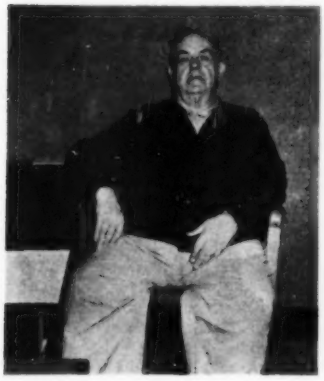
Left: Stone from the bins can be recrushed with this 3-ft. short-head cone crusher and returned to the screening circuit. A 4-ft. short-head cone crusher is to be installed beside this unit.

Buffalo Slag's New Plant

(*From page 73*)

series screens go into the bins, while the throughs are delivered to the correspondingly numbered screens in the B series; i.e., the throughs from screen A-1 go to the top deck of screen B-1. Similarly, the throughs from the bottom decks of the B series go to the single-deck screens on the lower level of the plant.

All recrushing is done at present with a 3-ft. Symons short head cone crusher which is mounted just outside the screen building. This crusher is fed through chutes from the storage bins, and its product drops onto a 24-in. inclined belt conveyor which discharges onto the 42-in. conveyor ahead of the screens, closing the circuit at that point. The design of the plant also calls for a 4-ft. short head cone crusher to be mounted next to the 3-ft. unit. This crusher will discharge on the same conveyor that serves the present crusher, but it will be fed from the bins by means of a conveyor instead of by gravity.



Clarence Swain, superintendent of the new Buffalo Slag plant.

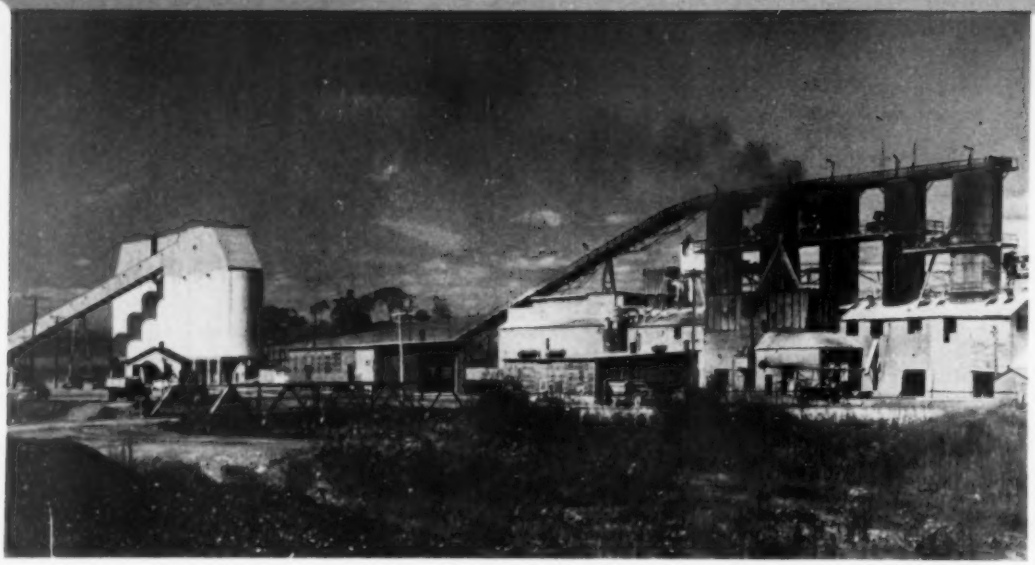
There are four steel bins on each side of the storage structure below the screens, or eight bins in all. These have a capacity of approximately 80 tons each. Normally seven sizes of material, ranging from 3-in. to dust, are produced. The various sizes are always stored in separate bins; and if blending is required, it is done when the materials are being loaded. Blending of sizes is done by drawing out of two or more bin compartments onto either of two belt conveyors (one 36 in. and the other 42 in. wide) located under the manually-operated bin gates.

Truck loadings have to date accounted for considerably more than half the material shipped from the new plant. In a single day truck loadings have totaled as much as 2,000 tons. Car loadings, however, also account for an important share of total shipments, and on some days as many as thirty 50-ton cars are loaded. In order to avoid being entirely dependent on the constant availability of trucks and cars to keep the full plant in operation, the company has begun developing a stockpiling area. Already in use on a limited basis, the area will be enlarged as conditions permit. Materials are transported from the bins to the various stockpiles by trucks and are subsequently reclaimed and loaded for shipment by means of a crane.

The output of the new plant is marketed for a wide range of uses, including general roadwork, railroad ballast, concrete, roofing, sewage treatment, and rock wool production. These markets provide outlets for the full output of the plant, or some 2,400 tons per 8-hour day. The present crew for the entire operation is about 35 men, this figure including supervision, maintenance workers, clerical help, car cleaners and eight men employed at the slag pits.

In addition to this new plant, Buffalo Slag has plants for the production of crushed slag at Lackawanna and Tonawanda, N. Y., and at Erie, Pa. The company also operates a sand and gravel plant at Franklinville, N. Y.

The officers of the organization are: L. A. Beeghly, president; H. N. Snyder, vice-president, treasurer and general manager; and H. E. Rainer, secretary. G. S. Snyder, manager of production and purchases, conceived and designed this plant. Field Engineer Wm. F. Pierce had charge of planning and construction. Clarence Swain is superintendent of the new plant, and Daniel Schultz is assistant to the superintendent.



A general view of the Beachville plant of Gypsum, Lime and Alabastine, Canada, Ltd., where considerable technological advancements in the use of vertical shaft kilns have been made. At the right are the five modern kilns, with the stone storage silos at the extreme left.

Although written for presentation before a group consisting largely of producers of industrial minerals other than lime, this paper contains much interesting information for lime producers. In it are embodied the results of extensive tests made by a large and progressive lime manufacturing company in an intensive program to improve its production methods and equipment, and the quality of its products. The results quoted indicate that this company has already made important contributions to the technological advancement of the lime industry.—The Editor

THIS paper is essentially a report on progress made in the use of modern vertical shaft kilns at the Beachville plant of Gypsum, Lime & Alabastine, Canada, Ltd. However, for the interest of those not thoroughly familiar with the lime industry, we will roughly summarize the processes involved.

The manufacture of lime by calcination of carbonate rock is a process that was in use for hundreds of years B.C., but like most of our industries, it has only recently been treated as a science, rather than as an art or a skilled trade. Actually, there is still little known about the physical and chemical laws applying to the relation between the burning of lime and the physical properties of the finished product, such as slaking rate and plasticity. However, the fundamental laws of heating and chemical dissociation can readily be applied to lime manufacture.

Limestone is a term loosely applied to any rock consisting largely of calcium carbonate, or a mixture of calcium and magnesium carbonates. Lime, therefore, may be nearly pure CaO, or a mixture of CaO and MgO. The two oxides have somewhat different physical and chemical characteristics, and for this reason, high calcium lime is generally used as an industrial chemical, while the magnesia limes are used largely for the building trade.

The difference in $CaCO_3$ and $MgCO_3$ is also an important consideration in the burning of lime. $CaCO_3$ dissociates to CaO and CO_2 at a minimum temperature of 1525 deg. F., with a heat of dissociation of about 680 B.t.u.'s/lb. at that temperature, while $MgCO_3$ dissociates at 1100 deg. F. and requires only 535 B.t.u.'s/lb. It can be readily seen that a magnesia lime will not require as much fuel, and also that, in firing a mixture of the two, there would be a tendency to overburn the magnesia component in order to calcine the calcium completely.

There are three general types of lime kilns commonly used today: the rotary kiln, the mixed feed shaft kiln, and the direct-fired shaft kiln.

Rotary kilns, which are most extensively used in the portland cement industry, are large expensive pieces of equipment. They have many limitations as heat-exchanging apparatus, and the preheaters and economizer necessary to make them reasonably efficient make them even more expensive and complicated. Their one advantage at present is their ability to burn stone of relatively small size, also sludges and slurries.

In the mixed-feed shaft kiln, the fuel is mixed with the stone as the kiln is charged. This type of kiln has been developed to a high degree in Europe, but has not been popular in this country, possibly because of customer reaction to the ash from the fuel being mixed with the lime, and also because coke is the only practical fuel for this application. However, because of ease of operation and the high efficiency possible with this type of kiln, the next few years may see an increase in its popularity.

The common-type, direct fired vertical shaft kiln consists of a chimney with furnaces, usually fired with coal, built into the sides, so that the combustion gases are pulled up through the stone. Stone is charged at the

*Paper presented by M. F. Parsons, kiln superintendent of Gypsum, Lime & Alabastine, Canada, Ltd., Beachville, Ont., at the 1950 meeting of the Canadian Institute of Mining & Metallurgy.

On the right is the building housing the lime storage bins, viewed from the sorting pan side. The kiln cars are drawn up the incline to transfer material from the stone storage bins (see picture on opposite page) to the kilns in the background.

top, and lime is drawn from the bottom at intervals to give a continuous process. It is this general type of kiln which produces a large percentage of the lime in this country today.

The main fault of this type of kiln fired with coal, is that almost all the air for combustion must pass through the furnace grates, and little or no air is drawn through the bottom of the kiln itself. On account of this, the lime has no chance to cool, and it is drawn red-hot at temperatures up to 1400 deg. F., with a large sensible heat loss.

To overcome this condition, it is essential to fire with a gaseous fuel which may be introduced at a point above the bottom of the kiln, drawing the air for its combustion up through the kiln to cool the lime and preheat the air. In short, a truly modern shaft kiln will be gas-fired.

A kiln of the direct-fired type described above might produce anywhere from 5 to 18 tons of lime a day, depending upon the size, and upon whether some form of mechanical draft is used. Good performance would be about 500 lbs. per sq. ft. of shaft area per day, and a fuel ratio of 3.5 to 1, for 14,000-B.t.u. coal, or about eight million B.t.u.'s per ton of lime.

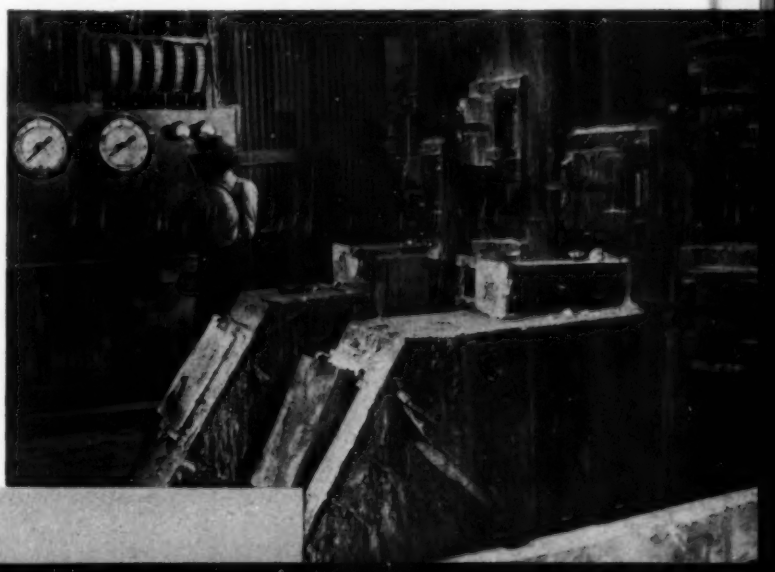
In comparison to this, the kilns at the Beachville plant have been operated for a period of over a year with an average production of 72 tons of lime per kiln per 24 hours operated. This is not deducting slow-firing time, or time lost on minor shutdowns for repairs. Actual running conditions give 75-80 tons per day. For a 57-sq. ft. shaft area, this works out at 2800 lbs. per sq. ft. per day, and the fuel ratio over the period mentioned was over 5 tons of lime per ton of coal, or about 5½ million B.t.u.'s per ton of lime.

The Beachville plant consists of five modern induced-draft vertical shaft kilns, fired with producer gas. One of these five kilns has been operating for only three months and is still in the experimental stage.

The original of this type of kiln was introduced to this country about 14 years ago. Since that time the kilns have been developed to the

recent developments in . . .

vertical shaft lime kilns*



This is the base of the No. 5, small stone kiln, still in the experimental stage, in which 2- to 4-in. stone is already being burned at the rate of 150 tons per day. The control panel is at the left.

present point under the direction of J. H. Robinson, general superintendent of the Gypsum, Lime & Alabastine, Canada, Ltd., with whose permission this paper is presented.

When these kilns were built, they were completely new and untried, and the decision to build them was a part of policy of the Gypsum, Lime & Alabastine, Canada, Ltd., of research and experimentation, considerably in advance of industrial practice. It has been the continual trial of new methods and new equipment which has developed the production to its present point. While we feel that the results we have obtained are considerably above average, we are not satisfied; and the experiments are being continued to raise the efficiency still higher.

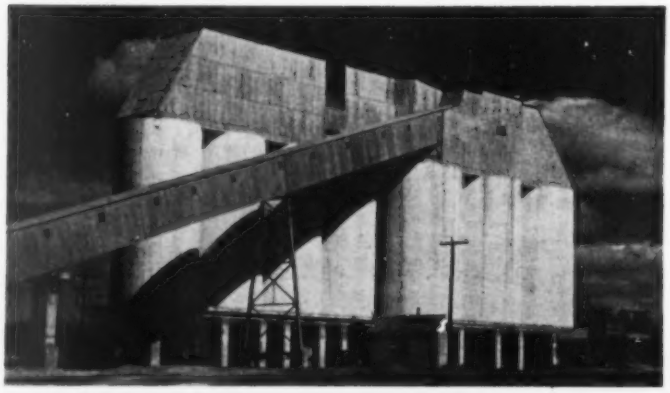
The most notable design feature of the kilns is the central flue type of burner. This burner is a flue passing horizontally through the kiln shaft. Small gas ports are spaced regularly along its length on both sides to distribute the gas to the kiln. The advantages of this type of construction are even distribution to the shaft cross-section and removal of the center of the combustion zone from the main kiln lining. Induced draft is supplied by a 20-hp. centrifugal fan connected to an off-take duct which, like the burner, passes directly through the kiln. This duct is located at a point about 15 ft. below the actual top of the kiln, giving a superimposed stone storage which automatically fills the kiln as it is drawn.

The shaft is about 6 ft. by 10 ft., inside measurements, at the burning zone, about 37 ft. from the burner to the fan duct, and the cooler is about 11 ft. deep. The lining is super-duty fireclay brick in the hot zone, and a hard low-heat-duty firebrick throughout the rest of the kiln. Some silicon carbide refractories are used in the burner and the poking doors.

The kilns are fired with producer gas manufactured in two 10-ft. automatic type gas producers. A good grade of West Virginia coal with a heating value of about 14000 B.t.u.'s is used as received. One point which may be of interest is that the producers are not blown with air and steam as is the usual practice, but with a mixture of air and CO_2 gas which is recovered from the kiln exhaust fans. The CO_2 is used to prevent clinker formation, but it does not raise the B.t.u. content of the gas as does steam.

The Beachville quarry works a limestone deposit of the Detroit River formation. The stone now being quarried runs to a depth of 55 ft. at the west end of the property and tapers to about 47 ft. at the east end of the quarry, about one-half a mile away. About 10 to 15 ft. of sand overburden is stripped by shovel. The underlying stone is limestone of the Bertie Akron formation and has a slightly higher MgO content. The Detroit River formation is of extremely high purity, running about 98 percent $CaCO_3$, so that the lime produced is very high in available CaO, and is in great demand as an industrial chemical. It should be noted that all figures in this paper refer to calcining of high-calcium carbonate rock, because different types of stone can give widely varying fuel ratios and production rates.

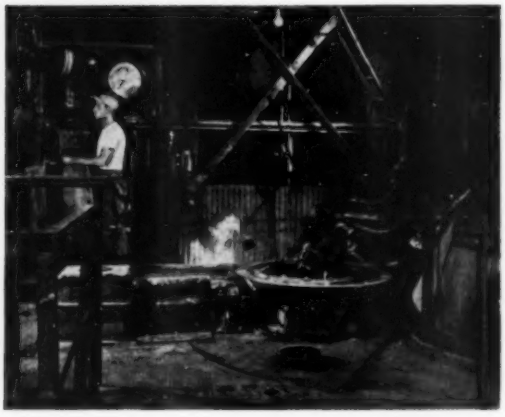
The stone burned is sized from 6 in. to 10 in. and from 4 in. to 6 in., and the kilns are operated under 4 to 5 in. of water top draft. The kilns are run on a 45-minute draw period; that is, the charge is moved every 45 minutes, and the drawing rate is such that the kilns hang some of the time, but not all of the time. The 45-minute period is the closest approach to continuous draw that we have

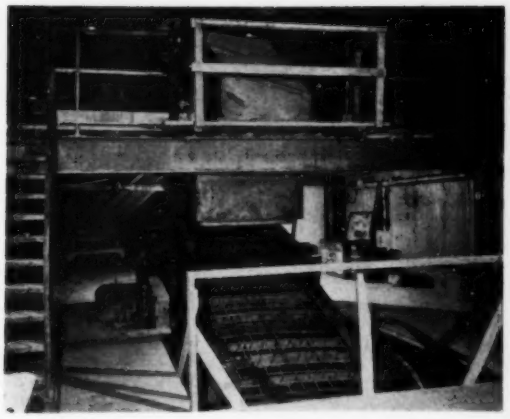


Left: A close-up of the stone storage silos. The kiln cars are loaded underneath and then drawn up an incline to load the kilns.

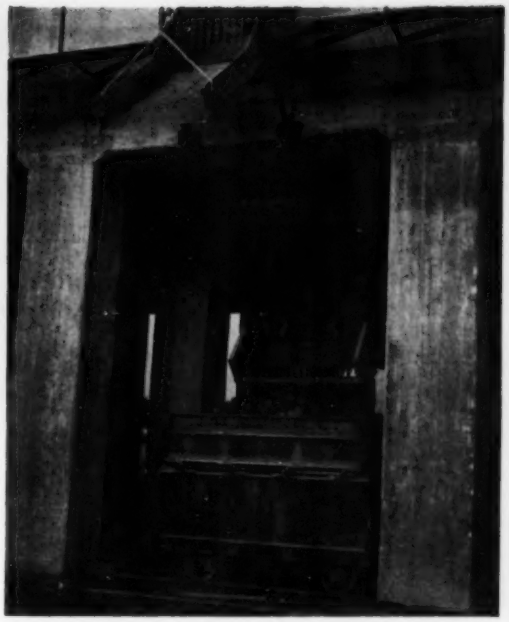
Below, left: A close-up of the sorting pan conveyor underneath the lime storage bins.

Below: A close-up of one of the two 10-ft., automatic-type, gas producers and control panel.





Above: A view of the first screen in the kiln stone processing cycle.



Right: Here a feeder is loading small stone into a kiln car underneath the stone storage silos. The kiln car will then be pulled up the incline to charge the kilns.

found practical with stone sizes larger than 4 in.

The present high rates of production have not always been standard practice at Beachville. Strangely enough, the higher fuel ratios were not obtained until the production rates were raised, and we have a system which is more efficient when being pushed than when running at medium capacities.

It is evident that to produce an increased amount of lime in a burning zone of fixed dimensions the lime must be burned in a shorter period of time, and therefore, necessarily at a higher temperature, if calcination is to be complete. Forcing the kilns means the burning of larger amounts of gas in the same combustion space; and gas analysis results have *not* shown enough improvement in combustion efficiency to account for the overall increase in the efficiency of the kiln. As there have been no other changes in external heat losses, we are almost forced to assume that the increased kiln efficiency is an effect of the higher temperatures employed.

To study the reasons for this, let us consider the vertical shaft as a heat-exchanging apparatus. Air and combustion gases are forced to travel directly through the whole kiln charge, and preheating zones, combustion zones, and waste heat recovery are all combined in one unit. Ideal operation would be to have the lime and the exhaust gases leaving the kiln at atmospheric temperature, with the total heat input used for dissociation of stone to lime and CO_2.

It is practically possible to draw lime at a temperature only slightly above atmospheric, but lime-kiln exhaust gases run at true temperatures of around 1200 deg. F. The reason for this is the fact that $CaCO_3$ dissociates at a minimum temperature of 1525 deg. F. Therefore, only heat which is available above 1525 deg. F. can be absorbed in making lime. Heat below this level must be used to preheat the stone, and only so much can be used for this.

Therefore it follows that the higher the temperature, the greater the percentage of the total heat above the 1525 deg. F. level, and the greater the kiln efficiency.

There are other ways in which high temperatures aid efficient combustion. High air and gas temperatures mean greater reaction rates between oxygen and the combustible gases, and therefore, more complete combustion. Also, in a lime kiln, there is considerable surface catalysis effect from the hot lime itself. The hotter the lime, the greater this effect.

The condition needed for high-flame temperature is preheating of air and gas. The amount of air preheating will depend on the heat absorbed from the lime in the cooler, which will depend on the temperatures of the lime going into and coming out of the cooler. By running a kiln with some lime always left in the hot zone, the temperature of the lime entering the cooler can be raised to about 2700 deg. F. This heat is easily picked up by the incoming air, because of the high temperature differential.

At the cold end of the cooler, the average temperature of the lime can be lowered by removing the lime in small amounts at close intervals rather than in large draws. The best cooler operation would be continuous draw system, but as mentioned previously, this has not been found practical with the larger stone sizes.

If the air is to be well preheated, it is necessary that combustion be carried out with as low an excess air condition as is (practically) possible so that the heat is not spread over too large a volume of air.

The producer gas is used hot from the producer at a temperature of around 1500 deg. F. There is a good reason for carrying producer gas temperatures a little on the high side in processes involving absorption of heat at high levels. Haslam and Russell in *Fuels and their Combustion*, show that heat values available above 2900 deg. F. are at a maximum for a producer operating temperature of about 1400 deg. F. However, below the 1400-deg. point the percentage of high level heat drops off very rapidly, while for temperatures above 1400 deg. F. the decline is quite gradual. This means that the

producer operation above 1400 deg. F. will give a more constant high-flame temperature, and the most efficient gas producer operating temperature for a high temperature process will not coincide with the temperature for best overall producer efficiency. (This is usually considered to be around 1200-1250 deg. F.)

Lime kiln draft serves two main purposes: first, to move the combustion gases through the kiln charge; and second, to draw in the air necessary for combustion. As kiln capacity increases, volume of combustion gases and products increase directly and the velocity of the gases incerases. The resistance to flow varies as the square of the velocity and, therefore, the draft required, increases as the square of the capacity. The fan horsepower required to move air against the higher draft pressures also increases rapidly. While draft varies as the square of the velocity, the rate of heat transfer from the gases to the lime also increases very nearly as the square. This gives the effect that even for very high kiln capacities, the height of the hot zone of the kiln increases very slightly, and the exhaust gas temperatures are only slightly higher.

In the cooler, the increased heat transfer rate allows a cooler of proper design to recover all the heat from the lime, regardless of the rate at which the kiln is operated.

If the stone being burned is reduced in size, the voids through the kiln charge are reduced, and the resistance is again increased. This increases the rate of heat transfer as mentioned above. At the same time, the smaller stone requires a shorter burning time because the heat does not have to penetrate to such a depth. It was mentioned previously that $CaCO_3$ dissociates at a *minimum* temperature of 1525 deg. F. That is the dissociation point in a neutral atmosphere. Under actual kiln conditions, however, the stone is dissociating in an atmosphere of 100 percent CO_2, (the CO_2 passing out through the layer of lime around the stone), and the temperature required to cause dissociation against such an atmosphere is 1650 deg. F. The larger the stone, the deeper the layer of lime about the core before calcination is complete, and the larger the percentage of heat above 1650 deg. F. required. Small stone, therefore, has the advantage of being able to use a slightly larger proportion of the total heat.

The No. 5 Kiln at the Beachville plant was designed to take advantage of the benefits of burning small stone. This kiln has two *centre burners* (gas distributing flues) running parallel through the shaft, and the lime is drawn continuously by means of electric vibratory feeders. The stone burned is screened from 2 to 4 in., and so far, top draft has been run at about 11 in. of water. As mentioned previously, this kiln is very much in the experimental stage, but it is already producing 150 tons per day, or 3,300 lbs/sq. ft. of shaft. Lime is drawn cold enough to pick up with the bare hand, and while there is no way of checking on the kiln individually, a high fuel ratio can almost be taken for granted.

The conclusions which we would draw from the foregoing evidence are that shaft kiln capacities of over 3,500 lbs./sq. ft./day are possible, and practicable, and that operation at such capacities may develop flame temperatures and combustion efficiency to the extent of requiring less than 5,000,000 B.t.u.'s/ton of lime produced. Operation at such capacities requires draft in the neighborhood of 12 in. of water, and the extent to which capacities can be increased will depend to some extent on the practical limits of mechanical draft equipment. Just how high capacities might be raised by increasing draft is rather indeterminate, because there is no way of knowing the extent to which temperatures could be developed.

The kilns at Beachville are run to conform to the general principles outlined above as nearly as possible, but there are some considerations which are based more on practical operations than on combustion theory.

For instance, induced draft kilns are prone to channeling conditions, that is, the tendency for one portion of the kiln to get hotter than the rest. Such a condition chimneys the heat and gas to the point that is already too hot, and if not caught in time, one-half of the kiln may become a fused mass of hard-burned lime, while the other part is drawn into cold stone. This tendency is regulated by differential drawing rates in the various corners, and in kilns working at high capacities the differential treatment must be applied quickly and definitely as soon as any channeling is noticed. The frequent draw intervals make it easier to spot such conditions before they become serious.

Finally, it must be realized that high production is essentially *continuous* high production, and each lime kiln must be operated at full capacity and top efficiency for every hour of the day. This can be done only by the development of a system and a routine in operation so that the same ratio of gas to air and the same combustion conditions are maintained day after day. The development of such a system and the elimination of variables in the operation are of first importance. In a producer gas-fired plant, this means a constant supply of constant-quality gas. The Beachville gas producers and the gas itself are checked regularly every hour. The CO_2 content in the blast air is controlled to within 0.5 percent, and blast volume and top gas temperature are controlled automatically by the use of instruments.

Cement Firms' Records Show Bigger Sales, Better Profits

Cement companies with fiscal years ending in September showed increased sales and better profits than in 1949. The great demand for all building materials during the year and the increase in road building and other types of heavy construction all contributed to a large and steady market for the entire year.

Alpha Portland Cement Company announced sales of $20,998,839 in 1950, against $21,024,047 in 1949. Profits rose to $3,359,123 from $3,350,820 in 1949. Marquette Cement Manufacturing Company announced sales of $18,850,310 and a profit of $2,645,910 for 1950, as compared with sales of $18,673,576 and profits of $2,509,470 for 1949. North American Cement Corporation's net income to September 30 was $1,161,662, against $944,677 for 1949.

Nazareth Cement Company showed a net profit of $606,783 for 1950, as against $547,166 for the year previous.

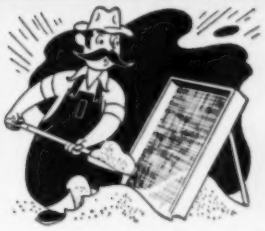
Pennsylvania-Dixie Cement Corporation reported gains in the third quarter, and Giant Portland Cement Company reported a 72 percent increase in earnings on a 35 percent increase in sales for the twelve months ending Sept. 30.

Purdue University Accepts Grants for Research Work

President F. L. Hovde of Purdue University recently announced several research grants and fellowships which had been accepted by the board of directors. Among these were the following:

$2,500 from the National Lime Association, Washington, D. C., to continue the investigation on lime soil stabilization under the Engineering Experiment Station; a grant of $3,000 from the Dow Chemical Company, Midland, Mich., for carrying on a study of the effects of calcium chloride on the properties of concretes made with portland cement; and $1,500 from the Calcium Chloride Association as a first payment on an investigation to be made in the civil engineering and engineering mechanics section of the Engineering Experiment Station.

Screenings



by William M. Avery

THE latest word on the cement shortage comes from Red Wing, Minn., where two men were sentenced recently to five-year terms in the state reformatory after admitting the theft of 100 bags of the precious stuff. Viewed as an exercise in the art of making the punishment fit the crime, the sentence imposed may seem a bit stiff in comparison with the monetary value of the stolen material, but obviously the court was influenced far more by the scarcity of the cement than by its market value. The same logic prevailed in the Old West when they hanged a man for stealing another man's horse.

We're going to keep a close watch on similar cases during the next few months with a view to developing an accurate index for indicating the severity of cement shortages. If it pans out, the present situation would be identified as a "five-year shortage", meaning that you can get five-years in the clink for stealing 100 bags. We hope the index will never register a "hanging shortage", but the possibility certainly exists.

Quick, Watson, the Needle!

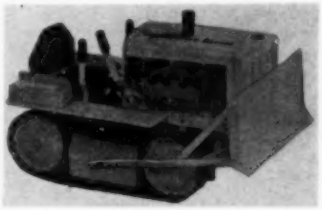
A MEMBER of the British nobility is in a jam with the Ministry of Works as a result of a sequence of events that surely could have happened nowhere else on earth except in England. It appears that the blighter wanted some stone walls built in his garden, but the Ministry of Works wouldn't allow him to buy cement for the project. So he had his masons try a mixture of cow dung and crushed bone as a substitute for cement. It worked bully, and he went back to the ministry official who controls the use of cement to see if he could go ahead on that basis. The ministry bloke said it was all right with him.

When they hauled the Earl into Magistrate's Court the other day for questioning in regard to the project, the fellow from the ministry reversed himself, expressing the opinion that the Earl should have obtained a license for cement "no matter what fixative he proposed to use." He told the magistrates that when the question first came up he had no knowledge of the adhesive properties of cow dung. Obviously the blighter never played cricket in a cow pasture.

The upshot of all this folderol was that the magistrates ordered the Earl, two architects, and several contractors held for trial. There is no indication that the government plans to take any action against the cows that were involved in the conspiracy, presumably on the grounds that they were no better informed than the ministry official in regard to the adhesive properties of their by-products.

Ride 'Em, Junior!

In case you're beating your brains out trying to decide what to get Junior for Christmas, you'll be glad to know that Saks Fifth Avenue will, for a consideration, supply a tractor-bulldozer outfit which the



little chap can actually ride. Your favorite journal is not supposed to quote prices, but we're happy to report that this won't cost you *quite* as much as a full-sized tractor-bulldozer, and it's guaranteed to raise just as much hell with your household furnishings.

Gold Strike

DOWN in Sydney, Australia, the other day they found 50 pieces of gold-bearing quartz in the gizzard of one of ten chickens delivered to a butcher shop. Our informant advises us that the source of the quartz remains a mystery because the gizzards were separated from the hens before the find was made. We suppose that if the gizzards had been cross-indexed with the chickens, it would have been a simple matter just to ask the gold-bearing hen where she made her strike.

Anyway, the incident serves one mildly useful purpose. It indicates that we don't have *all* the gold on earth buried at Fort Knox.

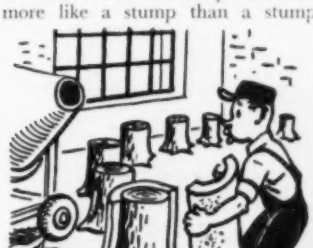
Culinary Sand

TWO new materials made largely of sand are about to invade the American home by way of the kitchen. One is a silicon compound used in place of grease to keep bread and cake from sticking to the pan. The other is a putty-like material for keeping stoves and ice boxes level and firmly in position.

We have no idea how large a market these two products will find, but we'll give you odds that tonnage-wise it won't even approach the amount of sand that comes into the kitchen with the spinach, or the considerable quantity the youngsters track in from their sand box.

Bad News for Woodpeckers

THE National Capital Parks office has announced with understandable pride that it has perfected a reinforced concrete stump that looks more like a stump than a stump



does, and is considerably more durable. This improvement on nature is used to support guard rails around dangerous curves on park roads. Henceforth the last line of Joyce Kilmer's poem *Trees* will read: "But only God and the National Capital Parks office can make a tree."

Instrumentation Applied To Cement Kilns

By W. G. LEFFERTS
Allis-Chalmers Manufacturing Co.

another P&Q exclusive

THE use of control instruments to assist the burner in operating cement kilns has grown steadily during the last 25 years. In comparison with modern equipment, suitable instruments of sufficiently rugged construction had not been developed 25 years ago.

The need for instruments originated through the necessity of producing high-quality clinker to meet rigid specifications. The use of instruments has now shown that better and more uniform clinker can be produced more efficiently when the operator has the essential factors of kiln operation under close control. Instrumentation is designed to increase burning efficiency and should result in an increase of the clinker output of a kiln.

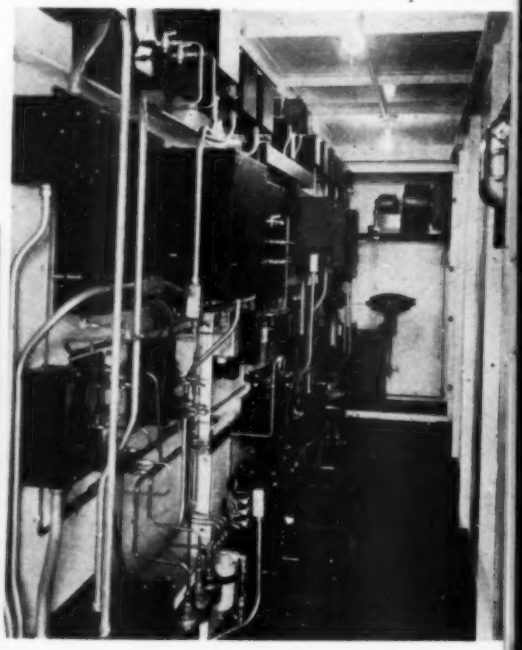
When the best conditions have been determined by experience from the various instrument readings, the burner automatically maintains these values constant without continual manual adjustment of controls. Several factors control the shape, size, and position of the flame in a rotary kiln, upon the correctness of which clinker production essentially depends. In a kiln fired with Bunker "C" fuel oil, they include oil temperature, size of orifice, oil pressure, velocity and quantity of primary air, and the draft conditions within the kiln and its firing hood.

Atomization of oil will remain constant with any one setting of the oil flow valve (when using a pressure-atomizing oil burner) provided that the oil temperature is maintained at a high enough level so that small variations in temperature do not produce an appreciable change in the viscosity of the oil. The oil temperature at the inlet to the burner should be approximately 210 deg. F., at which temperature a variation of plus or minus 10 deg. F. does not appreciably change the viscosity of the oil. Oil pumps are usually designed to pump more oil than the maximum fuel demand. The pressure at the burner is maintained by a pressure-regulating valve which allows the excess hot oil to be returned to the oil storage tank heater, thereby conserving heat in the initial heating of the oil for pumping. Oil burners for cement kilns must be capable of producing a long flame in order to produce clinker of the best quality. In addition, this flame should be maintained without too high a gas velocity through the kiln, lest too much excess air occur in the exit gas and an inordinately large amount of dust be carried over into the collectors. A pressure-atomizing burner, rather than a steam- or air-atomizing type seems best suited to this application.

When firing with oil, approximately 30 per cent of the total air for combustion is supplied as primary air with mechanically-atomizing or pressure-atomizing oil burners. Experience has shown that where it is possible to vary the induction of secondary air into the burning zone to obtain maximum combustion efficiency, best results can be expected.

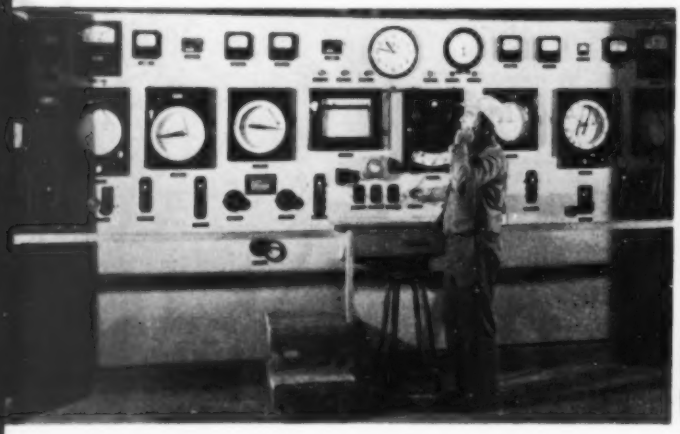
When a kiln is fired with natural gas, the method of control is similar to that of firing with oil. Mixing of the gas with primary air is accomplished at the burner, and control of excess air can be effected by varying firing hood pressure or dampering the primary air supply, or doing both by ratio control automatically or by manual damper regulation.

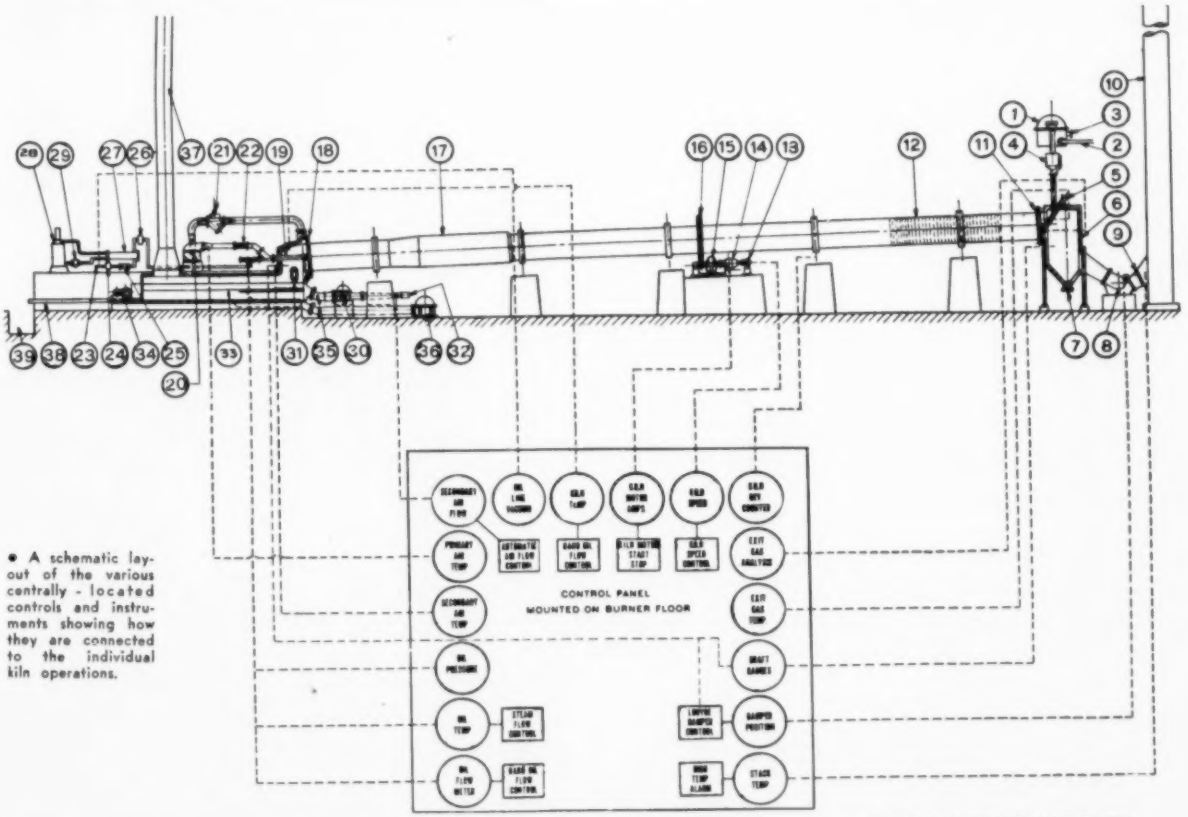
In coal-fired kilns, fineness of the coal as prepared by unit pulverizing coal mills depends on several factors, some of which can be automatically controlled. Those factors which can be automatically controlled are: volume of primary air flow which is used as a conveying medium for the pulverized coal into the kiln, temperature of the air entering the coal mill, and rate of coal feed to the mill. Here again a long flame is desirable for maximum production



• Right: Interior view of the master kiln control cubicle shown in the illustration at the left.

• Below: The master kiln control cubicle which is a part of a new wet process kiln installation in a Midwestern cement plant.





• A schematic layout of the various centrally - located controls and instruments showing how they are connected to the individual kiln operations.

1. FERRIS—WHEEL SLURRY FEEDER
2. SLURRY INLET
3. SLURRY OVERFLOW FROM FEEDER
4. SLURRY MEASURING POT FOR CALIBRATING SLURRY FEEDER
5. SLURRY FEED CHUTE
6. DUST CHAMBER
7. DUST HOPPER DISCHARGE
8. EXHAUST FAN
9. LOUVRE DAMPER FOR DRAFT CONTROL
10. EXIT GAS STACK
11. FEED END AIR SEAL
12. CHAIN SYSTEM
13. A.C. GENERATOR FOR SYNCHRONOUS TIE WITH SLURRY FEEDER
14. D.C. KILN DRIVE MOTOR
15. SPEED REDUCER
16. DRIVE GEAR
17. ENLARGED CALCINING ZONE
18. DISCHARGE END AIR SEAL
19. OIL BURNER BLAST PIPE
20. PRIMARY AIR FAN
21. AUTOMATIC TEMPERATURE CONTROL FOR PRIMARY AIR
22. SECTION OF FLEXIBLE PIPE
23. PIPE LINE FROM FUEL OIL SUPPLY
24. FUEL OIL FILTER
25. FUEL OIL PUMP
26. FUEL OIL METER
27. FUEL OIL PREHEATING HEAT EXCHANGER
28. STEAM BOILER TO FURNISH STEAM FOR PREHEATING OIL
29. BOILER FEEDWATER PUMP
30. SECONDARY AIR FAN
31. BAFFLE WALL TO SEPARATE CLINKER FROM SECONDARY AIR STREAM
32. VENTURI TUBE TO MEASURE SECONDARY AIR
33. RECIPROCATING GRATE OF AIR-QUENCHING CLINKER COOLER
34. RECIPROCATING GRATE DRIVE
35. COOLER GRATE AUTOMATIC SPEED CONTROL
36. FAN TO FURNISH AIR FOR FINAL COOLING OF CLINKER
37. COOLER WASTE HEAT STACK
38. CLINKER CONVEYOR
39. CLINKER PIT

of good clinker. A high primary air velocity is required to yield this flame. The adequate control of secondary air is again desirable to maintain burning efficiency.

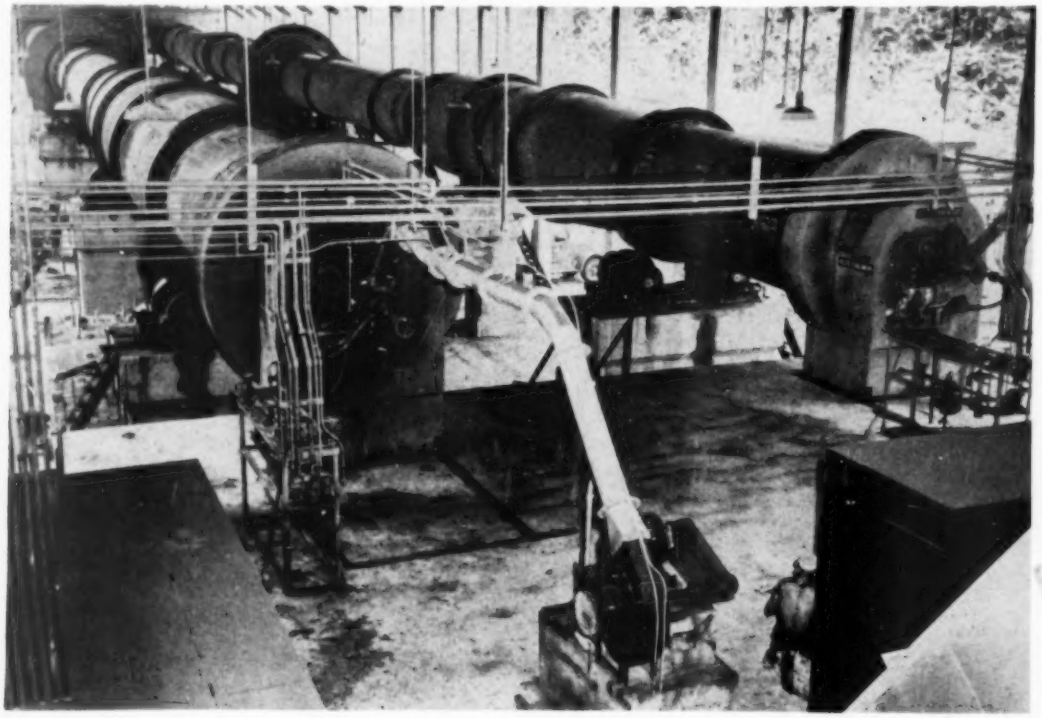
The particle size of the coal fed to the mill, as well as its composition and moisture content, depend upon the types of coal received at the plant. Commercial equipment is available for automatically controlling the flow of combustion air and fuel feed, but whether the initial cost and maintenance on this equipment is justified depends upon each installation. So far, comparatively few installations have considered the expense worthwhile.

The supply of secondary air is dependent upon two factors: the pressure in the firing hood and the flow of hot air from the clinker cooler. Let us now consider the former. The automatic draft controller is one of the most important aids in maintaining a constant and proper firing hood pressure, which is an essential condition for establishing efficient combustion as well as a suitable flame shape. Draft controllers have been in use for many years and are now available from instrument manufacturers with either electric or pneumatic damper operation. Each type has its advantages and disadvantages which must be considered to determine which method of control is more suitable for the installation in question.

The firing hood pressure is usually maintained at a slight negative value, and a range of plus .05 in. to minus .15 in. W.G. with respect to the atmosphere adjacent to the firing hood has been found satisfactory. The differential pressure between that inside the firing hood and that of the external atmosphere is transmitted to the draft controller, which in turn controls a pneumatic or electric motor to vary the position of a damper in order to maintain a constant firing hood pressure. The damper may be either in the inlet or outlet of the exhaust fan, or in the stack. Under normal operating conditions the hood pressure tends to vary slowly; consequently, a slow-moving damper drive unit is generally satisfactory. Pneumatic motors usually respond faster than electric motors for this type of service.

Now to consider the second factor, that of the flow of secondary air. The control of this factor is dependent upon the type of cooler used to cool the clinker as it leaves the kiln. Secondary air is heated as it cools the clinker. The heated air is then used to supply most of that needed for combustion of the fuel. In view of the intense heat at the kiln discharge end, some means of controlling this air should be incorporated in the cooler itself. The Allis - Chalmers "air - quenching" cooler reduces the temperature of the clinker so quickly from the outside shell of each nodule that the grindability of the clinker is improved.

In order to maintain a constant flow of secondary air from the cooler the pressure in the cooler must be held fairly constant. In the Allis-Chalmers air-quenching cooler this is accomplished by automatically varying the depth of clinker on the cooler grate to hold a constant under-grate pressure. Usually this pressure is about 1½ inches of water. The system controlling this is somewhat similar to the draft control system. Controlling electrical impulses or air pressures are transmitted to an electric or air motor which varies the resistance of a rheostat in series with the field of the cooler drive motor, and changes the speed and consequently the convey-



• The firing floor of two oil-burning kilns recently installed in a Central American plant. At the right is the common control cubicle for both kilns. The primary air blower shown is actuated by apparatus on the central control panel.

ing rate of the cooler, thereby controlling the depth of the clinker bed on the grate.

The Fuller cooler (also "air-quenching") has a set of automatic controls which varies the speed of the conveying grate in accordance with the temperature above the cooler grate. The higher this temperature, the faster the grate moves to convey the clinker. The temperature sensing is made by thermocouple which also responds to radiated heat from the clinker and cooler walls. Either type seems to do a good job of cooling, since the clinker as it leaves the cooler can be readily handled by the conveying system.

Many of the cement kilns installed in recent years have been supplied with instruments to measure and record the relative burning zone temperature. Since this temperature usually ranges between 2,400 deg. F. and 2,800 deg. F., a radiation-type pyrometer is generally installed to accomplish this. The pyrometer head may be focused either on the lining of the kiln or on the load in the burning zone. The radiating characteristics of the lining appear nearly constant for the range of temperatures encountered in operation, but the load appears to approach more closely the "black body" characteristic for which pyrometer heads are designed. Whether the absolute value of this temperature is correct is immaterial, since the burner is primarily interested in maintaining a constant burning temperature which will produce the desired product, rather than in knowing what the temperature actually is in degrees.

From the standpoint of the operator, an easily read indicator for this temperature is a great convenience and assistance in burning good clinkers. A record of this temperature may or may not be desired for future reference. Clean, dry, purging air is very necessary to reduce the maintenance on the pyrometer head, and attention to this detail has been found to be very worthwhile. The reading of this temperature indicator is sometimes used as the controlling factor in a system for automatically controlling the fuel-feed to the kiln.

Some means of measuring the temperature of the gases leaving the kiln is also usually provided, both as a means of improving kiln economy and to protect the induced draft or exhaust fan. This is usually accomplished by placing a long thermocouple in the hot gas stream at the feed end of the kiln. The instrument on the panel is usually an indicator-recorder which controls an alarm circuit to warn of a temperature high enough to damage the fan.

The most reliable system employs an alarm horn in conjunction with an indicating light. Both horn and light are energized by a high-temperature condition. The horn is silenced by a pushbutton when recognized by the operator, but the light remains in operation until the high-temperature condition is corrected. A record of this incident is, of course, made on the recorder chart.

Some installations have been made where intermediate temperatures inside the kiln between the firing hood and feed end are measured. Thermocouples in extremely rigid protecting tubes are projected through the kiln shell and fastened to it. Electrical connections to external circuits were made through trolley wires on insulators around the shell girth, and rubbing or rolling contactors. These thermocouples have been installed to measure the gas temperature ahead of the chain system and also in the calcining zone. In some installations noble-metal thermocouples have been installed in the burning zone of the kiln with indifferent results. The high temperatures involved, coupled with the severe mechanical shocks of chunks of clinker falling against the protecting tubes of the couples, impose a severe duty on any thermocouple placed in such a location. Maintenance then becomes a prime factor in order to insure reliability. Installation of the tubes in the kiln lining has been made, but speed of response then becomes so slow that an unsatisfactory burning temperature may exist for a considerable period before it is corrected.

An important instrument for keeping a check on the interior condition of a kiln is a draft recorder, which shows the draft at the firing hood and the draft at the feed end on the same chart. The difference between these two pressures is usually in the range of ½ in. H_2O to 1 in. H_2O in a new kiln. The result of an obstruction or ring in the kiln is readily apparent, due to the increase in pressure drop through the kiln. Drafts which are too high may also cause loss in operating efficiency or disturb the conditions essential to good clinker making. High draft differential would cause too much excess air in exit gas and waste of fuel. Flame shape would also be seriously affected by too much draft.

Other instruments can also be of great assistance to the operator. It is usual to provide voltmeters, ammeters, indicating lights, push-button stations, draft gauges, and pressure gauges within easy sight of the burner. Where kilns are driven by a variable speed motor, it is usual to provide an indicator-recorder to register kiln speed within easy sight of the operator.

Instruments to indicate the percentage of free oxygen in the kiln exhaust gas may save their cost several times over in a year. The oxygen analyzer as now available is considerably more valuable in the operation of a kiln than an instrument designed to give a combined reading for carbon dioxide and combustibles. It has been found that an excess of from 1 per cent to 2 per cent of oxygen in the exhaust gas represents perfect combustion. An indication of more free oxygen than this in the exhaust gas shows that fuel is being wasted in heating excess air. The combustibles recorder would indicate only zero for this condition, no matter how much excess oxygen were present. The carbon dioxide analyzer could not be relied upon to indicate excess air, as large quantities of carbon dioxide are liberated from the product during calcination.

Completely automatic kiln operation could in some instances be accomplished, but it is questionable whether the expense of initial installation and maintenance could be justified, since an operator would still be required in attendance on each kiln burner floor.

It is usual to provide a centralized panel or cubicle on the burner floor on which to mount the various instruments and controls. The criterion by which to determine which instruments and controls should be placed on this panel is whether they should be quickly readable by the operator. Certainly those instruments and controls directly affecting the operation of the kiln should be so placed. These would include the exhaust fan motor push-button station, the exhaust fan damper control, the feeder control or an indication of sufficiency of feed, the feed end draft pressure gauges, indication of excess air in the gases at the feed-end of the kiln, indication of the temperature of the exhaust gas, indication of the current to the exhaust fan motor (particularly useful when starting the kiln), pushbutton station and ammeter for the kiln drive motor, kiln speed indicator (if driven by variable-speed motor),

burning temperature indicator, cooler-drive and cooler-fan pushbutton stations and ammeters, cooler-fan damper control, clinker conveyor and scale pushbutton stations and counters, pushbutton stations for motors used in connection with fuel feed and primary air, and indicators for the rate of fuel feed. In a bin-fed coal-firing system where the coal is prepared and ground, then stored in a bin from which it is fed into the kiln, coal preparation before it is placed in the bin may not be the responsibility of the kiln operator. In this case the only instruments in which the operator would be interested would be the pushbutton station and tachometer for the coal feeder and the pushbutton station and damper control for the primary air fan. The cubicle serves not only to protect these instruments from physical hazards but to group them together in such a way that the burner can tell at a glance how his kiln is functioning. Since all wiring, cables, and piping are terminated at one place (the cubicle), installation is greatly facilitated.

The cubicle interior may also be made essentially free from dust by maintaining a slight positive pressure inside the cubicle, thereby greatly reducing maintenance on electrical contact-making controls and on instruments possessing many small, delicate parts. To accomplish this the latest cubicle design calls for a small blower with an air filter on its intake which is designed to connect to a duct from a comparatively cool and clean air source. Appearance may not be an economic factor to be considered, but a burner floor can certainly be made much neater by grouping instruments in a cubicle.

It has also been found that vibrations from nearby machinery can be greatly reduced in the cubicle by setting the cubicle on rubber pads. In most installations shock-absorber mountings for recording instruments are rendered unnecessary by adopting this procedure.

In a few cases where two kilns are located adjacent to each other, the instruments and controls for both kilns have been mounted in a single cubicle. One burner may then supervise the operation of both kilns. End cupboards built into the cubicle provide convenient storage places for cleaning materials and operating supplies such as charts, ink, and small spare parts.

Washington News

(*From page 74*)

tion as well are controls over department store charge accounts.

The purpose is obvious. The government is trying to make it hard for people to buy those things which use materials required in the defense effort. Thus far, government agencies have tried to do this indirectly; but the time may not be far off when much more direct means will be employed. "Rationing" is still an unmentionable word around Washington. But some people are beginning to talk privately about the fact that rationing of some items may soon be necessary.

Priorities and Allocations

At the producer's level a primitive kind of rationing has already begun. The priority system which has given socalled "DO" orders (defense orders) a priority over all others is already diverting some materials to defense purposes.

Many businessmen are unhappy about this system. The unhappiest are those who do not expect to get "DO" orders but who need certain materials to continue to operate their businesses. The pit and quarry industries appear to be in this group. They are unlikely to get "DO" orders. When they need materials such as steel, they and a wide variety of other industries are going to have to scramble for it. Under this system the most aggressive, rather than the most worthy, are likely to get the prized object.

Businessmen who expect to be hurt by the present system are trying very hard to get an allocation system adopted similar to that which was in operation during World War II. Allocations, of course, represent a more sophisticated form of rationing at the producer's level. It is hoped that thereby the scramble will be avoided. Industries which could not qualify for "DO" priorities would nevertheless have a chance of getting enough scarce materials allocated to them so that they could keep going.

There are many things standing in the way of an allocation system. First of all, the officials in charge have not made up their minds that it is necessary. They are not really in a position where they can make up their minds. The magnitude of the remobilization program is far from settled. Just as in World War II, the armed forces again are unwilling or unable to tell these officials what their requirements will be. It is still impossible to estimate how severe the shortages will be or how long they are likely to last.

The officials are very reluctant to set up an elaborate allocation program, only to find it unnecessary because the anticipated shortages never materialized. Furthermore, even if they were ready to set up such a program immediately, they would not be able to do it. The skilled manpower required to administer such a program is just not available. Also, there are no funds budgeted or available to pay for the cost of such an organization.

It seems perfectly clear at this time that Washington, whether it wants to or not, is going to wait this problem out. Since that is so, things are almost sure to get a lot worse before they get better for the businessman who does not have a "DO" order in hand.

Gypsum Rock Now Flows In Pipe from Quarry to Mill

An announcement made by Dr. F. M. Handy, engineer and manager of the Northwest Gypsum Company, states that the firm has adopted a pump-and-pipe arrangement for carrying crushed material from the Idaho side of the Snake River to the Oregon shore in the vicinity of Huntington.

This firm, doing business "on its own" after severing all connections with the former Westates Agricultural Chemical Company, now transports crushed gypsum rock from its quarry to the stockpile at Gypsum near Huntington. According to Dr. Handy, a milling unit will process the gypsum on the Oregon side. It is reported that 60 to 100 tons of material can be handled per hour. The company's deposit is directly across from one operated several years ago on the Oregon side.

Standards Bureau Report For 1949 Now Available

A summary of scientific investigations carried on at the National Bureau of Standards during the fiscal year 1949 is contained in a 101-page illustrated booklet just published by the Bureau and now available from the U. S. Government Printing Office.

N.B.S. Miscellaneous Publication 198, *Annual Report of the National Bureau of Standards for 1949*, 101 pages, 27 half-tone illustrations, 75 cents a copy, is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. (Add one-third publication price for foreign orders).

Sale of the Johnson Sand & Gravel Company near Larned, Kan., to Willis Eakin of Dodge City was announced recently. The business was founded about 25 years ago by the late A. P. Johnson, who died on June 15. Mr. Eakin owns a sand and gravel business at Dodge City. He will retain the present staff at the former Johnson plant.

Collective Bargaining and Organized Labor

By **ROBLEY D. STEVENS, J.D.**
Author, Former Official Representative, U. S. Department of Labor

FIFTEEN years have passed since the enactment of the National Labor Relations Act. During this period, thousands of cases have been decided upon by the NLRB and the courts in behalf of free enterprise and organized labor. However, in 1947 the Labor-Management Relations Act was passed in the public interest. A reading of the LMRA clearly sets forth certain conditions which management and labor unions must take into consideration so that they can play the game of human relations.

It is assumed that you understand why Congress recognized the conditions by gathering facts. Further, it is believed that you understand the purpose of the LMRA and "the intent of Congress." Further, practically every management in the nonmetallic minerals industries is familiar with the rules and regulations of the NLRB, the necessity for setting up collective bargaining machinery, the status of foremen and collective bargaining, the wisdom of modifying and terminating collective bargaining contracts, and procedures for settling labor disputes.

Since we are hearing much these days about collective bargaining, do your top-flight executives understand the nature of collective bargaining? It goes without saying that the success or failure of collective bargaining has an effect upon millions of people. Do you know the part the government plays in collective bargaining?

In the early days employers applied individual bargaining, but since the recognition of labor unions, they must engage in collective bargaining. Today there are approximately 16,000,000 unionized persons at work in the United States and about 50,000 collective bargaining contracts in effect. As a result management in the free enterprise system must do considerable negotiating in order to arrive at a satisfactory contract with labor.

Of course, the ultimate objective of a collective bargaining agreement is to offer benefits for all concerned. Naturally the contents of a labor-contract involve the terms upon which the negotiating parties agree. For example, management must negotiate on matters relating to: rates of pay; hours of employment; overtime pay; seniority rights; job classifications; hours of employment; premium for night work; holiday, Saturday, and Sunday work; discharges; vacations; and shop conditions. Of course, there are other provisions, such as conciliation and mediation in specific problems.

Collective bargaining has become an important part of the employer-employee relationship; its various aspects are here analyzed.

Most collective bargaining contracts are negotiated between management and the American Federation of Labor or the Congress of Industrial Organizations. However, there are independent labor unions which negotiate with free enterprise, but the foregoing labor organizations are the largest and most powerful ones with which management is concerned.

Further, there are two types of labor organizations. There are craft and industrial unions. The nonmetallic minerals industries are primarily interested in the second type.

It can be seen that union security and job monopoly are the objectives of a labor union. Do you understand the strategy and techniques their labor unions use? Do you understand why there is a strike? Why labor unions set up picket lines? Do you know the difference between a closed and a union shop? Do you understand why Congress actually passed the LMRA? Is the meaning of Section 7, which lists certain rights, clear to you?

Do your top-flight executives analyze carefully the part relating to unfair labor practices and the methods of enforcement of the LMRA? What about the salient features of Section 8 (a) (3), which permits an employer and his employees, through the processes of collective bargaining, to insert a union shop provision in the contract?

Since the LMRA offers a definition of collective bargaining, do you understand the standards set up? What working knowledge do you have of the "selection of representatives," "appropriate bargaining unit," "elections"?

Is your management adequately familiar with the fact that as an employer one may petition the NLRB for an investigation to determine which labor union shall represent his employees? The LMRA states that the NLRB shall investigate a petition if it has "reasonable cause to believe" that a question of representation affecting commerce exists and, for this reason, your management ought to be in the know when dealing with this factor of vital importance.

How does your management view the situation with regard to suits by and against labor organizations? Do you understand that if either a labor union or an employer violates the contract, suit may be filed in the Federal District Court for money damages?

Under the LMRA, "foremen and/or supervisors" are not considered "employees." Do your executives handling labor relations problems know whether the LMRA prohibits foremen and supervisors from forming a union? Do they know the difference between a single-plant and a company-wide basis, or whether master agreements affect both? What about industry-wide bargaining? Is your management in favor of it? Is attitude important when negotiating a labor contract? Who selects your negotiator? What are his duties, authority, and limitations? Will your company have several negotiators? Should your lawyer, industrial relations director, accountant, and production manager be present at the conference table?

Does your management make proper preparation prior to negotiating a collective bargaining contract? What is your plan of action when organized labor

meets with your management? What tactics do you use?

Do you evaluate labor union strategy? Do you have adequate facts and data to support your position? Are you cognizant of the importance of collecting labor relations information? How many sessions will you hold with organized labor? Will your management be the moving party? How will it handle demands?

In the light of the foregoing, management should not overlook labor relations data; and such information should be constantly collected and be brought up to date for obvious reasons. Does your management evaluate the BLS cost-of-living index and use it? For example, is your management exploring the following governmental agencies to obtain salient labor relations data: Bureau of Labor Statistics, Bureau of Labor Standards, Wage-Hour and Public Contracts Divisions, National Labor Relations Board, Women's Bureau, and Federal Mediation and Conciliation Service?

Does your management subscribe to the *American Federationist, The CIO News,* and the *Monthly Labor Review?* What about labor information from the American Arbitration Association and the Society for the Advancement of Management?

Are your "conferences" held in a desirable room with pleasant surroundings? Is there adequate personnel present? Does your management keep accurate and adequate records of all meetings with organized labor for future reference?

How do you handle counter-proposals? Were the results of the first meeting satisfactory to your management? Do you apply "horse-trading" when negotiating with organized labor? Who will prepare your collective bargaining contract in writing? What will be the duration of the labor contract—one or two years?

Since management and workers will have to live with the labor contract, how will it be put to work? Who will inform *all* parties as to the terms and meaning of the collective bargaining agreement? Will your management insist upon a multiplicity of clauses in the labor contract? Will your management recognize the labor union, once it signs a contract?

Do your executives know and understand who are the parties to a management-labor contract? Will there be union-management cooperation for the life of the contract?

How will your management handle the so-called management-prerogatives? Does your management understand what the National Labor-Management Conference of 1945 considered in this respect? Will there be a clause in your collective bargaining agreement which prohibits strikes and lockouts?

What about general wage provisions? Will you have a minimum and a maximum wage rate? Will there be a provision relating to temporary employees, time and motion studies, incentive wage plans, dismissal pay, promotions, transfers, discipline, and quits? What about provisions for handling grievances? What about arbitration?

Perhaps the easiest way for management to handle labor problems is to learn the salient features of the LMRA, so that it may formulate interpretations as nearly correct as possible.

Is your management making use of expert knowledge? Is it a qualified leader? Does it have organization? Is your management utilizing the studies of Frederick Winslow Taylor? Does it understand the difference between cooperation, responsibility, and authority? What about the line-and-staff groups? Do you have a smooth running personnel department? Are your labor relations specialists practical and well-trained?

Do you keep posted on how other representatives of free enterprise deal with organized labor? Is any discrimination made among your workers? Do your foremen and/or supervisors have a basis for understanding the importance of the employer-employee association? Can your top-flight executives interpret management's views to the workers? Who is responsible for putting orders into effect and for compiling labor relations reports? Are promises made to workers kept? Is there loyalty in your establishment? Can management talk the language of labor relations to its workers? It is well to be familiar with the terminology of collective bargaining.

Does your management have functional and activity charts reflecting progress in industrial relationships? Are your foremen and/or supervisors really a part of management? Has your management explained the advantages of free enterprise to the workers? Do you attempt to avoid industrial strife? What are you doing to help preserve free enterprise, even though you may have a collective bargaining agreement?

Does your management know why workers form a labor union? Can they reach the same goal with free enterprise? Do you treat the skilled workers the same as the unskilled; those that are covered by a labor contract and those not included? Have you made a study of the basis of the labor-management struggle?

Is your management human? Can it fight for a good collective bargaining contract? Will you refuse to bargain with a labor union?

If you recognize the foregoing suggestions, facts and procedures, you will know much about collective bargaining and organized labor. More efficient utilization of this information will result in greater accomplishment for free enterprise and create smooth labor relations.

Too much is at stake for management not to know the answers in its day-to-day industrial relations program.

In the light of collective bargaining has your management attempted to study whether its workers could reach the same goal with free enterprise? Do your executives make an examination of collective bargaining principles, practices, and procedures? Can your management control its functions with organized labor without governmental intervention?

Is your management utilizing to the fullest extent the facilities of the National Labor Relations Board and the Federal Mediation and Conciliation Service?

Are your foremen and/or supervisors administrative employees or, do they become a part of the policy-making group of your management, so that their weight will be felt when solving labor relations issues?

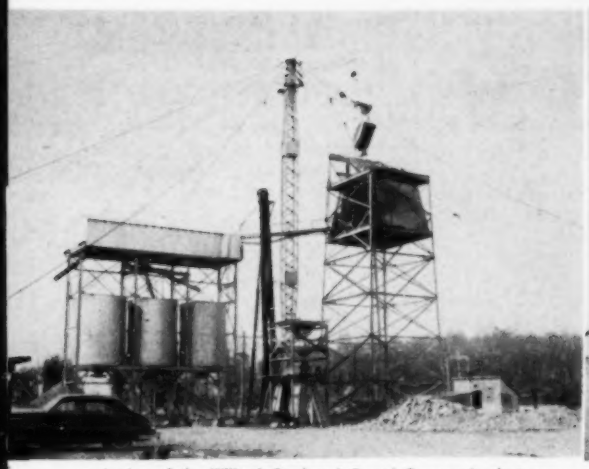
Are your top-flight executives good salesmen when working out collective bargaining deals? Do they develop their strategy for each problem, rather than trust to luck when involved in collective bargaining procedures?

Is your management well informed on prevailing labor practices, wage rates, hours of work, and general employment conditions involving pension plans of competing companies in free enterprise?

How far will your management allow the labor union to move in? How does your management handle a labor union's objection to the incentive systems, particularly if industrial engineers can demonstrate that its installation will improve methods of production and lower labor costs?

Is organized labor dubious about your proposed management time

(*Continued on page* 92)



• A view of the Killbuck Sand and Gravel Company's plant near Anderson, Ind., showing the cableway bucket dumping over the grizzly into the hopper above the primary crusher. The recrusher and elevator are in the foreground. At the right is the hoist house.

• Another view of the Killbuck operation shows the sand classifier at the left. Dominating the scene is the 101-ft. steel mast, one "terminal" of the 1,100-ft. span dragline cableway. In the foreground one of the two stockpile loaders is seen.

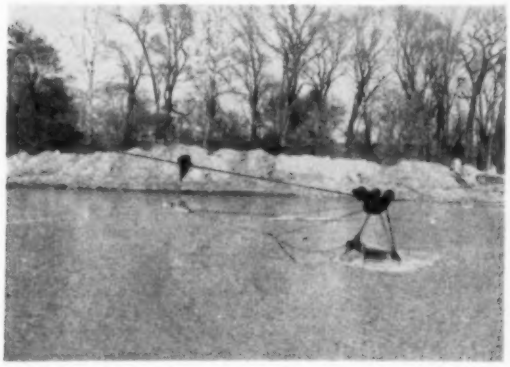
Glacial Deposit Furnishes Burke Brothers With Rich Source of Sand and Gravel

another ON THE SPOT report

AN interesting but logical series of events led the Burke brothers, George F. and Gary, to build the new 80-cu. yd. per hr. plant of the Killbuck Sand and Gravel Company near Anderson, Ind. Both started working in their father's construction business after leaving school, George in 1922 and Gary in 1932. In 1941 they built a ready-mixed concrete batching plant in Anderson to produce concrete for their own street paving contracts in that city and for sale. Then, primarily in order to get sand and gravel of consistent quality and gradation more cheaply, the brothers decided to build the new sand-and-gravel plant.

They had a particular piece of property in mind which had been drilled by the state and approved as a source of materials for state highway construction. Further testing was done by drilling and with a dragline before the brothers bought the 42-acre deposit. It is located about 6 miles north of Anderson between old State Hy. No. 9 and Prosperity Road. It is a glacial deposit known to be over 100 ft. in depth and present diggings are down nearly 80 ft. Near the surface the material is rather coarse with some boulders up to 15 in. dia. Farther down there is better grading of the material and at the 70-ft. level it is considerably heavier in sand fine enough for masonry applications.

The plant, which was purchased through Shoemaker Bros., Indianapolis, is a Telsmith standard all-steel plant with a capacity of 80 cu. yds. per hr. Because it was built on the deposit, a heavy foundation was necessary, using over 200 cu. yds. of concrete from the affiliated ready-mix plant. Construction was begun in July, 1949, and the plant went into operation on December 1 for a few weeks' test operation before winter. About 12,000 cu. yds. of surface gravel was produced during that period. The efficiency of this plant is evident from the fact that only three men are required to operate it.



• The 2-cu. yd. dragline cableway excavator bucket emerging from the pond with a full load. Over 40,000 cu. yds. of material had been taken from this cut by the Spring of 1950.

The land lies in the bottoms of Killbuck Creek, after which the plant was named. The overburden consists of 2 to 4 ft. of rich black dirt which finds ready sale in the vicinity. Two Little Giant (General Conveyor Co.) loaders are used to load the dirt into trucks.

Because the surface of the deposit is only 3 ft. above water level, it was decided to use a Sauerman dragline cableway excavator. This has a 2-cu. yd. alloy steel bucket and a 100-hp., 2-drum hoist. It operates on a 1,100-ft. span with a 101-ft. steel mast at the plant end. At the other end the cableway is attached to a bridle hitch between two "dead men" 150 ft. apart. Roebling hemp center, prelubricated wire rope is used, with a 1⅝-in. trackline and a ¾-in. pull line.

At the time this operation was visited in early May, 1950, a channel

• Loading the rich black dirt overburden from the Killbuck Creek deposit for sale locally. This operation is a very profitable sideline.

had been dug up to 70 ft. deep and 150 ft. wide at the far end. Over 40,000 cu. yds. of material had been obtained from this cut, and it was expected that much more would be obtained before the tail supports would have to be moved, probably late in the year.

The cableway bucket discharges the material over a 4-in. rail grizzly at the top of the plant. Oversize, forming only a small percentage, is wasted. The minus 4-in. material through the grizzly drops into a 35-cu. yd. hopper from which it is fed through a sliding gate into a 2- by 4½-ft. Telsmith vibrating screen. The plus 1⅛-in. over-size from this screen drops into a 10- by 36-in. Telsmith wheeling jaw crusher which is driven through V-belts by a 60-hp. motor.

The material passing through the screen (minus 1⅛-in.) and the crusher product are chuted to a Telsmith 5- by 17-ft. revolving screen over the bin structure. This has a 4-ft. section for sand, 5-ft. for pea gravel, 4-ft. for "L" gravel (⅜- to 1⅛-in.), and 4-ft. for "U" gravel (1⅛- to 2¼-in.). The three sizes of gravel are chuted into three circular steel bins of 90 tons' capacity each.

The sand from the screen is flumed into a 7-ft. Telsmith settling tank. By changing the size of opening on the sand section of the screen either No. 17 (brick) or No. 14 (concrete) sands are being made. Plaster sand can also be made if desired. Water for washing and sand classification is provided from a sump by a 6-in. Jaeger high-lift pump.

The company owns a fleet of 15 trucks for its ready-mix, aggregates, and construction operations. Of these, three Dodge dump trucks are ordinarily used for delivering sand and gravel from its plant to the ready-mix operation and elsewhere. They are loaded under the bins through sliding gates. Sand is loaded into trucks from the stockpile by a ½-cu. yd. Insley shovel. This machine, an Allis-Chalmers tractor equipped with a bulldozer, and the Little Giant loader previously described are also used for building up and reclaiming from the gravel stockpiles. All truck shipments are weighed on a Bonded platform scale.

At the time the plant was visited an installation was being made for the preparation of crushed gravel for black top pavement. A chute from the jaw crusher was to divert some of its product to a hopper over a 30- by 18-in. Pioneer double-roll crusher. This was to crush to ¼- to 1½-in. size and a bucket elevator was to feed it to the revolving screen.

Collective Bargaining

(*From page* 90)

study department? Since problems of wage administration are of major importance to your management, it is important that labor costs be controlled. As a result, management should work out a job analysis, job evaluation, and merit rating plan.

Have you conducted an employee morale survey lately? While wages are basically determined by collective bargaining today, when management is dealing with a labor union for some workers, what about the others?

If your company is engaged in interstate commerce, it will be subject to the Fair Labor Standards Act, which requires the payment of time and one-half after 40 hours weekly. How is your management handling the problems of white collar employees? Are you taking advantage of the exemptions for executives, professional people, and out-side salesmen? Has your management obtained a copy of the Proposed Revisions of Regulations, Part 541, for certain white collar employees? Are you utilizing this data to advantage? How do you handle the subject of unionization of white collar workers?

While the foregoing data is not offered as complete, in any respect, it will pay management to evaluate it accordingly.

If management policies are somewhat in line with others in the free enterprise system, it may be difficult for labor to move in and organize the workers. High standards for wages, hours, working conditions, and pension plans pay off for any management, in the opinion of experts.

Is your management making full use of the combined information mentioned above from the various sources cited? Investigation by management along this line is very worthwhile.

Has your management sent some of its topflight executives to attend college courses in collective bargaining and labor-management relations?

In conclusion, all possibilities of the proposals of collective bargaining must be carefully analyzed and evaluated by management, so that it may hold its own under existing conditions.

Collective bargaining agreements are enforceable under the LMRA, and your management will be bound to it. It is therefore important to negotiate a good labor contract. Management has a big job to do in handling collective bargaining and organized labor. Your whole business future may depend upon your facility in dealing with these important matters.

Big Potash Deposit Seen as Basis of British Industry

At Newcastle, England, Dr. Alexander Fleck, a director of the Imperial Chemical Industries Company recently told a group of 200 geologists and scientists that a 200,000,000-ton deposit of potash had been discovered in northeast Yorkshire.

The scientist stated that this discovery will make possible a saving of about $10,000,000 in annual potash import expenditures for the next 140 years. Great Britain has been importing an annual requirement of 250,000 tons of the material from the United States, France, and Spain. Dr. Fleck declared that the deposits would lead to the establishment of a vital new British industry.

Cement production in West Germany showed an increase in July, more than a million tons being produced during the month. This was a 55 percent increase over the 1948 figure. Cement exports in the first seven months of 1950 totalled 678,000 tons, more than 40,000 tons above the export figure for 1936.

Have You Filed Form 1099 Information Returns?

By HAROLD J. ASHE

Tax Counselor

WHILE all businessmen are familiar with the Bureau of Internal Revenue's Form W-2, known as the withholding statement, few are acquainted with another equally important informational return, Form 1099. Both Form W-2 and Form 1099 have the same fundamental purpose; to supply the Bureau of Internal Revenue with "information at the source" of income of taxpayers. Those required to file Form 1099 have the same responsibility as that attaching to the filing of Form W-2.

Just as the W-2 form informs the Bureau of wage and salary earnings of employees so too does Form 1099 undertake to inform the Bureau of other income taxpayers have. Using these forms, the Bureau is enabled to check the information supplied against the returns of particular taxpayers and thus ascertain whether all income received has been reflected in fact in the individual income tax return.

For example, few businessmen report to the Bureau the amount of interest (if any) they pay, or to whom it is paid. This is typical of the kind of information, subject to qualifications, sought by the government on Form 1099.

Form 1099 is designed to supplement and/or provide information not supplied by W-2. All persons and corporations must file Form 1099 whenever they make certain kinds of payments to another person of $600 or more annually, either in one sum or in total.

Payments include the following:

(a) interest

(b) rents

(c) salaries, wages and other compensation for personal services which are not subject to withholding and which have not been reported on Form W-2, including travel advances paid to an employee, profit-sharing payments, and pensions

(d) fees paid to attorneys, physicians, or other professional people.

(e) alimony or separate maintenance payments

Corporations must make a separate report on 1099 forms showing dividends or other distribution of $100 or more out of earnings paid to an individual stockholder.

There are some payments which, according to regulations, do not need to be reported on Form 1099, and which may qualify the foregoing.

Payments of this kind include:

(a) payments of *any type* made to a corporation (interest, for example, paid to a bank)

(b) bills paid for materials, supplies and similar charges.

(c) payments of rent made to agents who, however, must report such payments turned over to principals

(d) partnership salaries and profits paid to partners (this is reported in the partnership information return, Form 1065)

Form 1099 provides separate spaces for each category of payment, together with the name and address of the person to whom it is paid. A copy should be furnished, in the case of an employee, to the person whose income is reported, so that he will be able to complete his income tax return.

The 1099 Form returns are made on a calendar-year basis, even though the person or corporation filing 1099 is on a fiscal year basis. It must be accompanied by a letter of transmittal, Form 1096, on or before February 15, following the year for which the informational return is made. The return must be sent to the Processing Division, Bureau of Internal Revenue, Kansas City 2, Mo

Amend Standards Bureau Law To Define Status, Functions

A new law has been passed by Congress and signed by the President of the United States refining and describing the authorized functions and activities of the National Bureau of Standards. This law—Public Law 619, 81st Congress, approved July 22, 1950—makes clear and explicit the legal basis for the activities of the National Bureau of Standards. The law is primarily an amendment to Section 2 of the Act of March 3, 1901, which established the Bureau.

In accordance with the general policy of giving responsibility to secretaries of departments of the government, the new act assigns functions to the Secretary of Commerce. The act prescribes six functions in general terms, as follows:

(a) The custody, maintenance, and development of the national standards of measurement, and the provision of means and methods for making measurements consistent with those standards, including the comparison of standards used in scientific investigations, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the government.

(b) The determination of physical constants and properties of materials when such data are of great importance to scientific or manufacturing interests and are not to be obtained of sufficient accuracy elsewhere.

(c) The development of methods for testing materials, mechanisms, and structures, and the testing of materials, supplies, and equipment, including items purchased for use of government departments and independent establishments.

(d) Cooperation with other governmental agencies and with private organizations in the establishment of standard practices, incorporated in codes and specifications.

(e) Advisory service to government agencies on scientific and technical problems.

(f) Invention and development of devices to serve special needs of the government.

This general statement of functions of the National Bureau of Standards is supplemented by a more specific list of nineteen activities.

German Industrial Methods Covered in O.T.S. Publication

A new bibliography, one of the most nearly complete ever to be issued relating to captured technology from the German chemical, metallurgical, and process industries, was recently announced by the Office of Technical Services of the U. S. Department of Commerce.

The bibliography, a product of several years' work by L. Wilson Greene of the Army Chemical Corps, has been reproduced by O.T.S. because of its usefulness to the researcher in these fields who is seeking full information on German developments.

The bibliography contains well over two thousand document references with descriptive titles or abstracts, and includes, in addition to a 6000-entry subject, index, author indexes, and cross-indexes with O.T.S., British, and U. S. Military report numbers.

PB 101 458, *The German Chemical Industry, A Bibliography of the Chemical, Metallurgical and Process Industries*, 396 pages, sells for $10 per copy. Orders should be addressed to the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order payable to the Treasurer of the United States.

Feldspar has been recently discovered in the Nunn Lake region of northern Saskatchewan. A large outcropping of the mineral was located by Dr. J. B. Mawdsley, chairman of the department of geology, University of Saskatchewan, while engaged in studying uranium deposits around Nunn Lake.

Dewey Portland Cement's Kiln Installed in 14 Days

• Scene at the Dewey Portland Cement Company's plant near Davenport, Ia., as a section of a newly-installed kiln was unloaded from a railroad flat car to a trailer.

THE recently completed enlargement program of the plant of the Dewey Portland Cement Company near Davenport, Iowa, included the installation of a 11- by 375-ft. all-welded Allis-Chalmers rotary kiln. Speed records were set in placing and lining this kiln. It was received in four sections, each weighing from 55 to 67½ tons and each mounted on two flat cars. These sections were lifted off the cars into timbers by two crawler cranes, a P&H 855B and a Northwest No. 95.

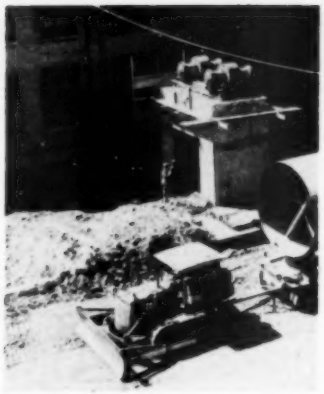
When ready to place a section it was mounted on two army tank retrievers, one at each end. These are 16-wheel flat-bed trailers of 52-ton capacity each. Each section was hauled 500 ft. to the site by two Caterpillar tractors, one pulling in front and the other pushing and steering from the back. When all four sections were in place alongside the piers the same two cranes were used to lift them onto the rollers on the piers and the timber cribbing which had been erected to support the ends of the sections. The crane booms were kept as nearly vertical as possible at all times and the cranes were kept between the piers so they could walk in and lower the sections in place.

The tires six in all, were then lifted and slid over the ends into place after which the sections were accurately aligned and welded together. The soil under the cribbing and at the piers had previously been thoroughly tamped so it would support this weight. This entire operation from cars to completed shell in place took only 14 working days.

The kiln was lined by the company's forces in 3 weeks, working two 8-hr. shifts daily. Much of the credit for this speed is given to the use of a Hough pneumatic-tired loader for hauling the brick into the kiln direct to the point of use. Abrasion resisting castable refractories were used at the feed end of the kiln.

• A crane lifts one of the four sections from its position beside the pier onto rollers and timber cribbing.

• At this point two of the kiln sections were in place, with the riding rings ready for positioning. The entire operation required only 14 working days.



• Here a tractor is towing a section of the kiln into position alongside the footings.

Hawkeye Portland Cement Co. Changes Corporate Name

G. F. Hetherington, president of the Hawkeye Portland Cement Company, Des Moines, Ia., recently announced that the corporate name of this firm had been changed to the Hawkeye-Marquette Cement Company.

Mr. Hetherington emphasized that this signified no change in product, management, or organization. The alteration in name is being made simply to clarify the company's relationship to its parent organization, the Marquette Cement Manufacturing Company. The Hawkeye-Marquette Cement Company will remain a subsidiary of the Marquette company and will continue to sell cement in Iowa and portions of Minnesota, North Dakota and Nebraska, as before.

The San Francisco Chemical Company has purchased a total of $200,000 worth of new mining equipment, to be used in expanding phosphate rock operations at Montpelier, Idaho. Four 22 yd. Euclid trucks and a Marion 111 M 3½-cu. yd. diesel shovel were included. The plant now produces about 600 tons of pulverized rock daily.

Do It Right—!

*how to recondition carbide bits properly to obtain maximum speed and footage**

CAREFUL attention to details, sometimes so elementary as to be overlooked in the rush of meeting production schedules, is the key to economical drilling and maximum life for carbide bits. Proper handling procedures and bit reconditioning methods will pay real dividends to the operators.

Three precautionary measures in handling carbide bits stand out in importance. First make sure that the bit is installed properly. Be very certain that the threads are clean. Wire brush them for the best results. Turn the bit up tight to the shoulder, using the proper wrench, to insure a snug fit.

Second, remove the bit correctly. Here again always use the proper wrenches for the job. Never strike a carbide bit with a hammer, since this may spall the insert.

Last, inspect the drill-rod threads frequently. This is especially important when using carbide bits. When the threads show appreciable wear, be sure to replace them in order to avoid losing a bit. Likewise, threads in the bit itself should be examined when removed from the rod. Particularly when drilling in soft ground where extreme footage is obtained and carbides seldom wear, failure of the bit is frequently due to thread failure.

Whenever reconditioning carbide bits, the following rules should be rigidly followed:

Do use silica carbide grinding wheels, preferably 80 grit.

Do grind bits when worn down 1/8 to 3/16 in. flat at the outer edge of the insert.

Don't attempt to dress the gauge of the bit unless equipped with special grinding equipment. This is required only in unusual cases.

Do maintain as near an even height as possible on all inserts.

Don't leave any sharp edges or corners on inserts.

Don't overheat the bit while grinding.

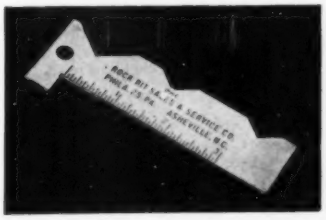
Don't hollow-grind inserts by using too small a wheel or through carelessness in dressing.

Don't dress the insert to too sharp an angle.

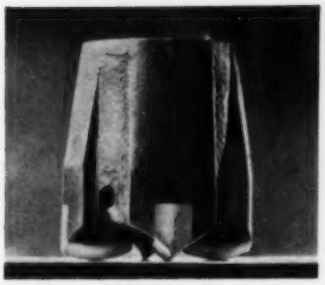
Don't grind off more bit body than is necessary to give the proper angle on the insert.

Do follow carefully the methods pictures below for the best results.

*Information and photographs are obtained from a pamphlet prepared by Rock Bit Sales and Service Company.



• Pictured above is the handy gauge of the type that most manufacturers of carbide bits can supply. It provides a quick and easy check when reconditioning bits.



• A correctly ground crown, pictured here, results in longer life for carbide bits. Check this by setting the bit on the face of the gauge as shown.

Correct

• The proper method for grinding a chisel bit is also the easiest method, as shown here. By simply swinging the carbide bit's cutting edge backward and forward against the grinding wheel, the correct cutting angle is automatically produced. Prove this by using the gauge as a check.

• In grinding a cross bit, the oscillating motion of the cutting edge on the grinding wheel will quickly restore the carbide bit to its original cutting efficiency. Be sure and grind only until the gauge reveals the result pictured here. Care and frequent checks give the best results.

Incorrect

• Never hold the chisel bit squarely against the wheel in one position continuously. This improper method of grinding results in a concave, too sharp cutting edge as shown by a check with the gauge.

• Here again by holding the cross bit against the grinding wheel continuously in one position, the cutting edge becomes too sharp and concave. A quick gauge check tells the story in every case.

personal mention

H. W. Graupner

HENRY W. GRAUPNER, general sales manager for Marquette Cement Manufacturing Company for the past seven years, will move to Jackson, Miss., on January 1 to take up new duties as sales manager for the Mississippi - Southeastern Arkansas-Louisiana area to be served by the company's new plant now under construction at Brandon, Miss. He will head the sales office to be opened by Marquette in Jackson early next year.

Mr. Graupner first joined the Marquette staff 26 years ago as Arkansas sales representative. Two years later his sales record there and broad familiarity with the area generally won him a promotion to special representative for the company's entire Southern Division. In 1933 he was appointed sales manager in Memphis, Tenn., and ten years later he moved into the office of general sales manager at Marquette's Chicago headquarters. This post will remain vacant during Mr. Graupner's absence, company officials stated.

Effective November 1, 1950, FLOYD H. COMPTON was appointed chief engineer for the Pennsylvania-Dixie Cement Corporation, with headquarters at Nazareth, Pa., succeeding Stewart H. Dewson, deceased.

Mr. Compton, a graduate in mechanical engineering at Lafayette College, served as conservation engineer for the Portland Cement Association from 1920 until 1922. From 1922 until 1937 he was employed by the Louisville Cement Company as superintendent and chief engineer. He has been employed jointly by the Allentown Portland Cement Company and the Valley Forge Cement Company as general superintendent and chief engineer since 1937.

THOMAS SHEETS, chief engineer of the Southwestern Portland Cement Company, Fairborn, O., and WALTER E. GAY of Edgar Otto and Son, Albuquerque, N. M., were speakers at the International Mining Days convention in El Paso, Tex., recently. Mr. Sheets discussed modern machinery in quarrying, mining and manufacturing in the cement industry. Mr. Gay's subject was the importance and value of pozzolan concrete.

ALBERT E. CLEMENT has been appointed assistant superintendent of the Natrona plant of the Pennsylvania Salt Manufacturing Company, it was announced by William F. Mitchell, Pennsalt's vice-president in charge of manufacturing.

Mr. Clement, formerly Natrona production supervisor, now will supervise all phases of the operation of production facilities at the Natrona plant, including the two utility subsidiaries—the Natrona Light and Power Company and the Natrona Water Company.

ROBERT CLARKE, formerly assistant production supervisor, has been appointed production supervisor to assume Mr. Clement's former duties and will be in active charge of chemical plant operations.

R. H. B. SMITH, former Boston sales manager for the Lawrence Portland Cement Company, has been placed in charge of the Augusta, Me., office of the firm. He replaces the late George W. Hinkley, who was acting sales manager for several months during the illness of WALTER E. BOWE.

Mr. Bowe, Maine sales manager for the last seven years and previously district sales manager in charge of the Boston office, retired on July 15. He joined the Lawrence organization in 1924 and will remain with the company in an advisory capacity.

KENNETH G. WOODARD, who has been for the last two years associated with the Engineering Department of the Contracting Division, Dravo Corporation, has joined the staff of the Mann Engineering Company, Pittsburgh, Pa., who represent the Fuller Company and the Marietta Concrete Corporation in western Pennsylvania and in Ohio and West Virginia.

PHILIP E. HEIM, vice-president in charge of sales for the Carbon Limestone Company, Lowellville, O., and president of the Agricultural Limestone Institute, was in charge of publicity and public relations for the 104th annual Canfield Fair held at Canfield, O., August 24 to September 4.

ROBERT J. UNGER was recently named assistant to the president of the Lawrence Portland Cement Company, New York. He was previously assistant purchasing agent for the company.

GEORGE H. BAKER has been placed in charge of the Employee and Public Relations Division of Wyandotte Chemicals Corporation, Alpena, Mich. Mr. Baker was formerly with the American Potash & Chemical Corporation.

ROBERT A. COSTA has become a member of the staff of Kaiser Gypsum, a division of the Kaiser Industries, Inc., Oakland, Calif., as assistant to the general sales manager, with headquarters in the Kaiser Building in Oakland.

DAVID WILLINGHAM was elected president of the Louisville Cement Corporation, Louisville, Ky., at a recent meeting. R. K. HARTSOCK was named vice-president; B. F. MARTIN, as vice-president and treasurer; and W. P. LEAKE, vice-president. Mr. Leake is superintendent at the Speed Cement Company plant, Speed, Ind., a subsidiary of the Louisville firm.

GEORGE D. SUDLOW, vice-president in charge of sales, American Rock Wool Corporation, Wabash, Ind., has been elected president of the National Mineral Wool Association. C. J. RUSDEN, president of Feltrock Insulation Manufacturing Company was elected vice-president; and W. R. ROBINSON JR., president of United States Mineral Wool Company, a director.

SAMUEL GUSTAFSON, mineral commodity specialist, will head a newly-created statistical branch of the U. S. Bureau of Mines in Minneapolis, according to a recent announcement. This branch will cover Minnesota, Wisconsin, Michigan, North and South Dakota, Nebraska, Iowa, and the Missouri Basin.

ALFRED W. BALDWIN was elected a vice-president of Featherlite Corporation, Dallas, Tex. He will direct a $200,000 expansion program for the company at Strawn for the production of lightweight aggregate from expanded shale.

The following officers were re-elected at the annual meeting: JACK FROST, president; ALEX T. MICKLE, executive vice-president; J. R. STUART, vice-president; MISS CAROLYN ROBINS, secretary-treasurer; and MURRY TOOMBS, assistant secretary and acting assistant treasurer.

JAMES H. HOWE, superintendent of the Cape Girardeau, Mo., plant of the Marquette Cement Manufacturing Company is project superintendent of the expansion program at Des Moines, Ia., and will be located there for several months. FRED NICHOLAS will be acting superintendent at Cape Girardeau.

HAROLD W. SWOPE, former O.P.A. counsel, was appointed a consultant for the U. S. Interior Department's minerals and metals defense agency.

THOMAS P. BLACK, president of the Black White Limestone Company, Quincy, Ill., was recently named treasurer of the Industrial Association of Quincy.

Col. Wendell W. Fertig, professor of military science and tactics, the Colorado School of Mines, has been named acting assistant to the president. Col. Fertig is a veteran of the Philippine campaign, World War II, and organized underground resistance in the islands.

A retirement and two appointments in the Operating Department of Universal Atlas Cement Company were announced today by L. M. Funderburg, vice-president, operations, of this U. S. Steel subsidiary.

Roy L. Slocum, plant manager of the Universal, Pa., plant has been retired after more than 45 years of service with the corporation.

Emmert F. Harchelroad, assistant plant manager, Universal, Pa., plant succeeds Mr. Slocum as plant manager. Richard M. Kelley, general operating foreman, Universal, Pa., plant, was appointed assistant plant manager.

Mr. Slocum was first employed at the Homestead Works of the Carnegie-Illinois Steel Corporation in 1905. He joined the cement company in 1907 as construction foreman when the Universal cement plant was being built, and in 1910 became assistant superintendent. In 1930 he was appointed plant manager.

Mr. Harchelroad has been with Universal Atlas since 1915, and Mr. Kelley in 1947.

Mr. Kelley joined the Cement Company in 1947 as a Practice Engineer at Universal Plant after serving three years in the U. S. Army. He became General Operating Foreman in 1948 and has held this position until his present appointment.

Robert C. Hills, Thomas R. Vaughan, and Richard C. Wells have been elected vice-presidents of Freeport Sulphur Company by the board of directors.

Mr. Hills started with Freeport in 1934 as a chemist at the company's sulphur operations in Louisiana. He became assistant to the president in 1946 and director of development at the beginning of this year.

Mr. Vaughan, an attorney, joined Freeport in 1942 and became assistant secretary later that year. He has been an assistant vice-president since 1947.

Mr. Wells came to Freeport in 1939. He was made assistant treasurer in 1942 and in 1946 became controller, in which position he continues.

Mervin A. Fay was appointed assistant general sales manager of General Refractories Company, Philadelphia, Pa., effective November 1, 1950. Mr. Fay has been with the Research Department of the company since 1946, as ceramic engineer, having previously been associated with Bethlehem Steel Company in a similar capacity. He is a graduate of Pennsylvania State College and a member of A.I.M.E. Mr. Fay has written numerous technical papers on refractories.

obituaries

Denver Bentley, 50, Xenia, O., was suffocated when he was buried under 150 tons of crushed rock in the raw mill hopper at the Universal Atlas Cement Company's plant near Fairborn, O., on October 3. Officials stated that Mr. Bentley climbed into the hopper to loosen material around the edges and was trapped in a slide.

Roy R. Wilson, owner of the Decatur Hydraulic Sand and Gravel Company, died recently in a local hospital from a heart ailment. He was 73 years of age.

Walter L. Young, 49, a mechanic and crane operator for the Heib Sand and Gravel Company, Louisville, Ky., died as a result of burns suffered in an accident in a gravel pit in Utica, Ind.

Sir Charles Davis, 72, former Lord Mayor of London, and a leader in British cement industries, died recently in London, England. He was the author of the book *One Hundred Years of Portland Cement, 1824-1924.*

Julius Joseph Dreiling, 62, credit manager of the Peerless Cement Corporation, Detroit, Mich., died recently in Jennings Hospital, Grosse Pointe, Mich. He had held the position of credit manager with Peerless for 28 years.

John Furlong, 63, president of the Indiana Limestone Company of New York, died at his home in Mount Vernon, N. Y., on October 13. He had been associated with the company and its predecessors for more than 40 years.

Robert Maloney, 38, former president of the Fairfax Sand and Crushed Stone Company, Thomas, Va., died in the Garfield Hospital, Silver Springs, Md , on October 12. He established the Fairfax company after his army discharge in 1945 and sold it in 1949.

Charles Warders, an employee of the Blue River Sand and Gravel Company, Marysville, Kans., was accidentally drowned while at work. The body was discovered several days after the accident occurred. Mr. Warders was 44 years of age.

Charles Emery Lagow, 70, was fatally injured in a grade crossing accident at Kleberg, Tex. Mr. Lagow was in the gravel business for 40 years. He was a member of the firm of the Lagow Gravel Company, Dallas, Tex., and an owner of two gravel pits at the time of his death.

Alexander R. Martin, a technical consultant in mining engineering for Barker, Smith & Company, New York, N. Y., died recently in a hospital after a brief illness. In earlier years Mr. Martin had been general manager of the Beaver Asbestos Company at Thetford Mines, Quebec, and subsequently vice-president of the Martin-Bennett Asbestos and Chrome Mines, also at Thetford Mines, and president of the Nicolet Asbestos Mines, Ltd. in Quebec.

Mr. Martin also was associated with gold and copper mining interests which took him to Venezuela. From 1943 to 1945 he served the Navy Department at the Johns-Manville plant in Manville, N. J. He was 68 years of age.

Joseph Fernolio, an employee of The Warner Company from 1913 until 1949 at Bellefonte, Pa., died on September 1. He was pensioned in December, 1949, because of illness.

W. W. Bucher, who was the thirtieth president of the Associated Equipment Distributors, and a member of that organization for the last 16 years, died unexpectedly on October 3. Mr. Bucher was president of the R. E. Brooks Company of New York and had spent his entire business life in the construction machinery industry.

Mr. Bucher was elected executive vice-president of A.E.D. in 1948, and in the following year he was installed as international president at the association's thirtieth annual meeting in Chicago. He was 58 years of age.

Joseph Bilyk, an employee of the Universal Atlas Cement Company for 25 years and of the Lawrence Portland Cement Company at Northampton, Pa., for the last five years, died recently in a hospital of that city after an illness of two weeks. Mr. Bilyk was 57 years of age.

In an explosion which occurred at the Calaveras Cement Company's plant at San Andreas, Calif., on August 29 Harvey Grant, 20, and Max Wuddell, 49, employees of the firm, were killed and seven others were critically burned. The cause of the accident was not reported.

new machinery and supplies

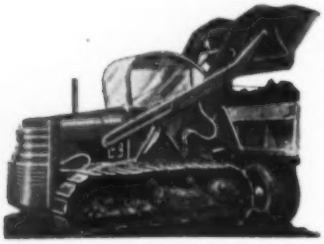
PIT AND QUARRY

A new 25-ton "DiesElectric" locomotive crane is announced by American Hoist & Derrick Company, St. Paul 1, Minn. The new unit, designated as the American Model 825 DE, is manufactured under the company's patent for DiesElectric locomotive cranes. All deck operations are accomplished by diesel power direct from the engine. Travel is by electric motors, mounted in each truck, a direct connected, traction type generator supplying the current.

● Combination Shovel

The "Lodover", a 1-cu. yd. combination overhead and front-end shovel for International Harvester tractors, is a product of the Service Supply Corporation, Philadelphia 32, Pa.

According to the manufacturer, this unit substantially increases loading production, since turns are eliminated. It is claimed that by eliminating two turns in every cycle, crawler shoe, tractor frame and engine maintenance costs are reduced; output has been stepped up as much as 50 percent; and operator fatigue is lessened—with resultant higher production. Tests have shown, states Service Supply Corp., that as many as 1,900 turns per 8-hr. shift can be avoided. The firm cites the following additional advantages: high-speed front-end loading; facility of operation in traffic and under obstructions; ability to handle tough digging; balanced design in mounting; controlled down pressure for extra digging power; positive bucket control; three-lever control of all operations; overhead protection for the operator; and compact power control.



● Automatic Spreader

Salt, sand, cinders, stone, and all types of abrasive materials can be effectively spread in any width from 20 in. to 30 ft. from any dump truck body up to 8 ft. in width, by the new "Century Hydraulic Spread-All," according to the Century Engineering Co., Waukesha, Wis. The device reportedly will operate with equal efficiency as a centrifugal spreader, using a spinner, or with a tray for seal-coat and other work where uniform, controlled width of spread is necessary.

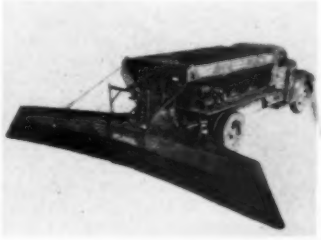
The Spread-All agitator shaft breaks up and moves material from the trough sides to the center for ice control and vice-versa for seal coating. Damage to the machine by coagulated, non-crushable material is eliminated with Century's incorporated pressure-relief system.

Hydraulically operated from power take-off of the truck engine, the operation is completely automatic, push-button controlled from the cab, and may be operated while the truck is moving forward, in reverse, or while motionless.

● Lime Spreader

A combination lime and fertilizer spreader is being manufactured by the Highway Equipment Company, Inc., Cedar Rapids, Ia.

A separate engine powers the distributor discs to give full width and uniform spread regardless of truck speed. The quantity per acre is regulated by a conveyor which is powered from the truck drive shaft and which controls the quantity supplied to the discs at any truck speed. A slanted and tapered hood aids in uniform distribution and reduces the effect of wind disturbance.



B.F.Goodrich

The tire that thrives on a diet of mud and razor-sharp rocks

TIRES hauling ore-bearing clay from pit to mill in barite mining service lead a difficult life. The tires on the equipment shown being examined above, operated by the Baroid Sales Division of the National Lead Company, Potosi, Mo., have been working under the following routine:

One minute they are backing out on raw clay in the pits — a clay that has the consistency of putty when moist, but like rough stone when dry. Next, they are carrying a twelve-ton load to the mill over a road of flint and quartz — a surface similar to broken razor blades.

Yet, the operators report they have experienced *no road delays due to tire trouble* since B. F. Goodrich tires were put into service in 1947. This big cut in operating costs is largely due to the exclusive protection of the patented *nylon shock shield* found only in B. F. Goodrich tires (with *double* nylon shock shield in larger sizes). Layers of nylon cord, built between the tread and body plies, shield the cord body by smoothly distributing shocks and strains.

These BFG tires have a special deep tread designed for just such service. The BFG Rock tires shown above have wide, continuous-running ribs that give more wear at vital points. The heavy, non-directional cleats on the shoulders give a deep bite in forward or reverse, on moist clay or hard quartz. And the tread material is compounded to resist cutting.

Regardless of the type of tire service your equipment demands, your B. F. Goodrich retailer has a cost-cutting answer. See him and be sure to specify BFG tires for your new equipment. Enjoy the extra savings of patented nylon shock shield protection at no extra cost. *The B.F.Goodrich Company, Akron, Ohio.*

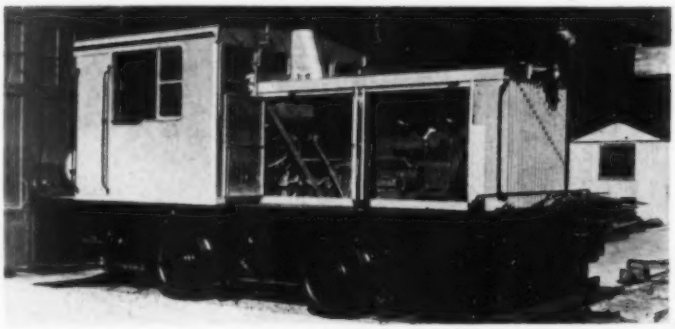
RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER

● Dump Trailer

A high-speed trailer, the "PD-20," has been introduced by the Athey Products Corporation, 5631 W. 65th St., Chicago 38, Ill. The trailer is a semi-bathtub type with tapered sides and one low side for easier loading and dumping.

Dumping is by hydraulic power from the tractor, with models for either right or left side discharge available. The trailer is designed to go with the Caterpillar DW 20 diesel tractor. With tractor the unit is 42 ft. long and just over 12 ft. wide, with a height of 9½ ft. The trailer has a wheelbase of 24 ft. and a tread of 102 in. and 24⅞ in. of clearance under the frame.

High-strength steel is used in the all-welded construction of the trailer with emphasis on impact resistance. It is designed for operations at speeds up to 20 m.p.h.



A hydraulic torque-powered locomotive is being made by the Plymouth Locomotive Works, a division of The Fate-Root-Heath Company, Plymouth, O. The advantages claimed for this type of locomotive include the following: reduction of shocks and vibration; uninterrupted acceleration; smooth power flow; and ease of operation.

● Portable Plant

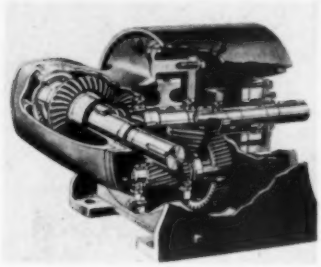
A single-pass portable crushing plant, "No. 6," is now available from Pioneer Engineering Works, Minneapolis 13, Minn.

The plant has a mechanical feeder, a 2- by 3-ft. two-bearing vibrating screen, and may be equipped with a roller-bearing jaw crusher. The conveyor blends the material from the screen and crusher and can be used for truck loading, bin loading or stockpiling. V-belt drives work the crusher and screen; other drives are high-speed roller chain.

The plant is mounted on a two-axle chassis with pneumatic tires. A semi-trailer hitch is available. This plant was designed to meet the need for a low-cost crushing plant where new equipment funds are limited.

● Speed Reducers

The Falk Corporation, Milwaukee, 8, Wis., has recently issued a series of new engineering bulletins describing and illustrating its line of speed reducers. These include parallel shaft, right angle (illustrated), concentric shaft, and horizontal or vertical applications. A full



line of ratios is available from a minimum of 1.5 to 1 to a maximum of 970 to 1, and horsepower ranges from 1 to 2,000. Improvements in gearing, bearings, and design are featured in the new models to give a wide range of power transmission, according to the company.

● Hook-on Wattmeter

A new hook-on wattmeter applicable to active and reactive power measurements in single and polyphase circuits is being made by General Electric's Meter and Instrument Division.

Type AK-2, the new device, permits measurements to be made without service interruption. It uses a removable magnetic hook to surround the conductor, and potential leads are connected

as in a conventional single-phase wattmeter. A three-phase balanced power measurement is also possible by the hook-on unit. This is accomplished by passing two power leads through the hook and connecting the potential leads to these same two power leads.

Through the use of a single dial switch, a selection of six power ranges is available to provide readings from 3 to 300 kilowatts.

The simple-switching, direct-reading scales of the new wattmeter, introduced as a companion unit to the AK-1 hook-on voltammeter, have resulted in one-hand operation and a smaller possibility of error.

More Information, Please

CHECK AND MAIL THE CARD BELOW FOR ADDITIONAL INFORMATION ON NEW MACHINERY AND SUPPLIES

1. Ten Questions to Ask a Diesel Engine Salesman. 28-page booklet supplying answers to questions pertaining to diesel engine design. Gives full mechanical details on Murphy diesel line of engines. Murphy Diesel Co.

2. Get More Work Done with Super C Tournadozer and C Tournapull with LeTourneau Electric Controls. First bulletin deals with construction, transmission, engines, 4-wheel traction, tires, control, blade, and other general features; second covers the electric control features —motor, generator, differential, power steer, air brakes, interchangeability, etc. R. G. LeTourneau.

3. Lubricate—The Modern Lubricant. 54 pages. Data book containing general information on this product, principal uses, and a list of industrial applications. Fiske Brothers Refining Co.

4. Keystone Specialized Lubricants. Form C10L. 30 pages. New edition of the Keystone Application Guide, including tested recommendations for lubricating all types of bearings, power generation, transmission, and materials-handling equipment, also recommendations covering lubrication of pump glands, valves, and parts in contact with acids, alkalies, and moisture. Keystone Lubricating Co.

5. Bulletin R-29. Describes in detail Allmul firebrick, giving principal characteristics and qualities. Babcock & Wilcox Co.

6. Handy Guide to Selection of Centrifugal Pumps. (Bulletin 52B6059G) Catalog of economical pumping units, including close-coupled, pedestal, double suction single-stage, multi-stage, self-priming, fractional horsepower, coolant and circulating, fire, process, solids-handling, marine, rubber-lined, paper pulp, sewage, axial, and mixed flow pumps. Supplies head capacity charts and tables for various types of pumps, along with data on sizes, capacities, and construction features. Allis-Chalmers Mfg. Co.

7. Eriez Atomagnets Here! Flier on three new models of Eriez Atomagnets—"Extrapower," "Ultrapower," and "Superpower." Describes uses, supplies dimensions and specifications, and pictures method of operation. Eriez Mfg. Co.

8. Hardfacing Catalog. 20 pages. An illustrated catalog containing detailed information on the complete Airco line of hardfacing alloys. Includes a description of the product, typical uses, mechanical properties, chemical analyses, and a brief outline of recommended procedures. Data is supplemented by a tabulation of recommended grinding wheels for dressing deposits of Airco hardfacing alloys. Air Reduction Sales Co.

9. Diamond Rotor Lift Portable Plants. (Bulletin D-50-G) and **Quarry Plants** (Bulletin D-48-A). Former lists outstanding advantages of roto-lift design, approximate capacities, and specifications and describes the design, operation, and performance of these plants. Fully illustrated. Second gives similar information on both portable and stationary plants. Diamond Iron Works, Inc.

10. Two-Bag Knickerbocker Mixers (No. 1148) and three fliers on other Knickerbocker units. Specifications, design features, performance, etc., given for each type. Fliers describe mortar and plaster mixer (5500 series, No. 6), general purpose mixer (No. 3 T5), and the No. 3½-SE. Knickerbocker Co.

11. Honeywell Instrumentation Data Sheet No. 9.1-4. Deals with safety features inherent in pneumatic transmission, as applied to central stations. Illustrated with photographs and a cutaway, keyed drawing of a pneumatic transmitter unit. Minneapolis Honeywell Regulator Co.

12. Rebuilt Power Equipment and **Here's the Reason.** First is a catalog of motors, generators, and motor generator sets, fully illustrated. Second is "the complete story" of the firm, stating its policy, guarantee to the buyer, conditions of sale, etc. Chicago Electric Co.

13. Elmco Rocker Shovel for Rock Loading (Bulletin No. L1019A) and **Elmco 104 Rocker Shovel in Sand and Gravel.** The first stresses economy features, and supplies specifications. The second (two-color bulletin) presents by illustrations and text the applications of this unit (Elmco 104) in sand-and-gravel operations. The Elmco Corp.

14. Wire Rope Conservation Bulletins. Deals with subjects such as the following: Why corrosion shortens wire rope life; how to lengthen wire rope life by proper sheave maintenance; importance of safety factor for wire rope; lubrication and length of service; correct rope reeving; regularity of inspection; correct selection; protection against corrosion; preforming of wire rope; and shock loads. Macwhyte Co.

15. Five bulletins on five types of Falk speed reducers. (Bulletins 2105, 1110, 1105, 1115, and 2110). Contain data on selection method, horsepower rating tables, torque capacity tables, overhung loads, dimensions, backstops, flexible couplings, order guide, etc. Falk Corp.

16. Complete Remote Control for D.C. Arc Welding Machines. Flier on electrode holder which has controls mounted at its end, welding cable, and a control box—the three parts of Foster Remote Control equipment. Foster Transformer Co.

17. A Pettibone Mulliken Product by Hain. Illustrated bulletin (No. H-850) on clamshell buckets. Contains information on various types of multi-sheave buckets, construction features, tables of capacities and dimensions, and descriptions of other Hain products. George Hain Mfg. Co., Inc., division of Pettibone Mulliken Corp.

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More Information, Please

18. Bulletin No. 402. Presents the Marion Type 111-M. A complete design and performance story on this equipment, designed for the quarrying, construction, and mining industries and for coal stripping. Marion Power Shovel Co.

19. Bulletin R7-8. Vest-pocket P & H electrode guide with tabs marking various types of electrodes. Contains a 2-page comparative chart listing corresponding types. Harnischfeger Corp.

20. There's a Fruehauf Coupler for Every Hauling Requirement and **Fruehauf Winches.** Former features several types of couplers and contains a chart illustrating the method of power transmission from the tractor to the trailer. Second illustrates and describes six models of winches, with rated capacity, gear ratio, approximate weight, and cable capacity for each. Fruehauf Trailers.

21. Roebling Wire Rope for Excavators. Catalog A-913. Gives rope recommendations; contains sketches of shovel, crane, dragline excavator, trench hoe, and skimmer applications; and explains hoist rope strand constructions. John A. Roebling's Sons Co.

22. Permalite Technical Data Sheet. A file sheet supplying general information, suggested uses, typical applications, and technical data. The sheet also contains a table of mix design data for permalite concrete. Great Lakes Carbon Corp.

23. Korfund Vibration Control. 4-page illustrated folder containing an isolation selector chart, typical specifications, and descriptions of following types: spring, rubber, cork, cork and rubber. The Korfund Co., Inc.

24. Air-Crete—Air Entraining Agent for Concrete. Flier on this air-entraining agent in liquid form, giving general characteristics, applications, and other information. The Carter-Waters Corp.

25. Hewitt Servall Hose. Bulletin No. 137. Vest-pocket folder which carries specifications, construction information, industrial uses, and a list of Hewitt products. Hewitt-Robins Inc.

26. Folder. Covers full line of Lubriko greases for anti-friction bearings; gives use and application data for 25 different Lubriko densities ranging from liquid greases to heavy cup lubricants. Also contains facts on lubrication maintenance and selection. Master Lubricants Co.

27. Caterpillar Hydraulic Bulldozers. Straight blade, Numbers 83, 75, 65, 43, and 25; angling blade, Numbers 8A, 7A, 6A, 4A, 2A. A wall chart showing these models, each with its specifications and dimensions at the side. On the reverse side are cutaway, keyed illustrations of the hydraulic jack, control, and bulldozer. Caterpillar Tractor Co.

28. Hard-Facing Alloys in Coils for Automatic Electric Application. 4-page bulletin illustrating types used in various applications. Complete table of specifications, with prices. Smoody Company.

29. Bulletin D-2228 and Bulletin 76-X. First describes in detail the Joy 22 HD heavy-duty diamond core drill, including specifications. Second similarly covers the complete line of single-drum, multi-purpose hoists for mines, construction jobs, etc.; includes a selection chart. Joy Mfg. Co.

30. Barber-Greene New Model 374 Heavy-Duty High-Capacity Portable Belt Conveyer. (Bulletin 374) Describes the complete range of the 374 and lists uses and applications. Accessories are pictured. Construction features are given, along with their operational advantages. Barber-Greene Co.

31. Bulletin. 8 pages. Describes in detail the mechanical features of the Wemco sand pump. Tables of pump capacities, pipe friction, and pulp densities are given to aid in determining and specifying sand pump requirements. Western Machinery Co.

32. Clark Powered Hand Trucks. 3-color bulletin featuring Electro-Lift and Hydro-Lift trucks. Stresses economy features, supplies data on construction features and dimensions, and pictures many applications. Clark Equipment Co.

33. Link-Belt Gearmotors, Motogears and Helical Gear Drives. Book No. 2247. Contains detailed information, tables of load classification, selection, overhung loads, slide rails, dimensions, and also a price list (effective July 31, 1950) and Link-Belt gearmotor, motogear, and helical gear drive data sheet. Link-Belt Co.

34. Put Towmotor MH on Your Material Handling Jobs and **Overhead Guard.** First is a novelty folder which lists special advantages of Towmotor equipment, with emphasis on the economy possibilities. Second is a flier describing overhead guards for the greater safety of the operator. Contains specifications and dimensions. Towmotor Corp.

35. Five bulletins on International Harvester equipment: **International Diesels—Engines and Power Units; International Engines and Power Units** (gas, gasoline or distillate); **International tractors; A Change to International Power Makes Dollars and Sense;** and **High Production, Low Costs—with International Pit and Quarry Power.** First two are wall charts. All fully illustrated. International Harvester Co.

36. Booklet on Plurajet cavity blasting unit. Describes the Plurajet shaped blasting charge and its application to the quarry and mining industries. Contains pertinent questions and answers. Complete descriptions of various sizes of charges are included. Shaped Charge Explosive Mfrs., Inc.

37. Farval Spray Valve. Bulletin No. 60. Presentation of a spray valve which sprays oil or grease by compressed air. Sketches show the manner of operation. Also shown is a photograph of a Farval spray valve installed on a modern press. The Farval Corp.

38. Thermoid Transmission Belting. 8-page bulletin containing technical data on flat transmission belting to aid plant engineers and operating personnel in selecting the right types. Formulas, charts, and tables are included. Thermoid Company.

39. Bay City Crane Mobile. 24-page catalog with 74 illustrations showing the construction features and applications of this 20- to 25-ton unit. Bay City Shovels, Inc.

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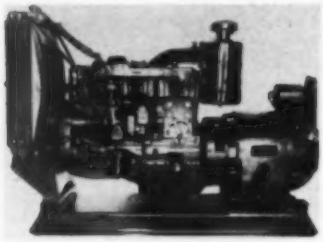
● Diesel Electric Generators

Production of a standard commercial line of Cummins diesel-powered electric generator units has been announced by the Cummins Engine Company, Inc., of Columbus, Ind.

Continuous duty, sixty-cycle units are available in 40-, 50-, 60-, 75-, 100-, 125-, 200- and 250-kw. ratings based on .8 power factor, and 50° C. (90° F.) rise. Similar units are also available for 50-



cycle operation at a slight de-rating in kw. capacity.

These diesel generator units are designed for continuous service applications where the unit is the primary source of power. Optional equipment offered by Cummins for the various generator units includes automatic overspeed shut-down control, automatic high-temperature and low-lubricating oil pressure shut-down, complete marine-type or radiator-type cooling systems, hydraulic governor, water-cooled exhaust manifold, and generator-mounted package control unit. Special generator voltages and kw. ratings are also available.

The standard diesel generator units as offered by Cummins Co., are of the alternating current type, 50-60 cycle, 3-phase 3-wire, 3-phase 4-wire.

● For High Dumping

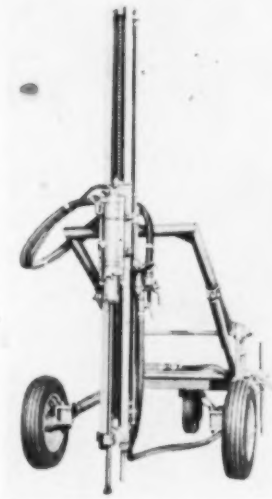
Dempster Brothers, Inc., Knoxville, Tenn., manufacturers of the "Dempster-Diggster," an automotive hydraulic shovel and loader, have announced a new model specially equipped for high dumping. At extreme height, the lowest point of the digging bucket of this new Type HL, Model 100 Dempster-Diggster is 13½ ft. from the ground.

This Diggster has a crowd reach of 10½ ft., and will dig through an 18-ft. bank. According to the manufacturers, the Dempster-Diggster is the only small shovel that operates with hydraulic crowd-and-hoist action; it is also available with crawler-type traction.

● Wagon Drill

Schramm, Inc., West Chester, Pa., manufacturers of air compressors and construction tools are featuring the addition of a wagon drill, "WDR-126", to complete their line of golden anniversary tools.

This tool is equipped with a 4-in. drifter and is said by the manufacturer to drill holes at any angle, in any direction, to depths of 24 ft. or more, and to drill flat holes at any point from 2 in., to 9 ft. above the ground. The air



feed is continuous and the WDR-126 will blow the hole clean.

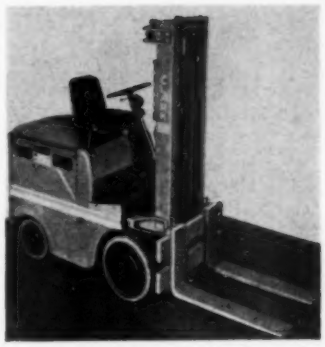
The main wheels swivel 90 degrees for line drilling and 180 degrees to obtain a narrow tread, permitting the machine to be operated in confined spaces. The wheels can be locked in any operation.

● Fork Truck

Compactness and maneuverability resulting from reduced over-all width and increased speed are among the major features claimed for the 3,000-lb. capacity 24-in. load center electric "Carloader" fork-lift truck, by the Clark Equipment Company, Industrial Truck Division, Battle Creek, Mich.

Automatic acceleration is accomplished through a master power-switch regulated by an automatic timer, making driving almost identical with that of an automobile equipped with automatic gear-shifting device. Controls are the non-plugging type which prohibit change in the direction of travel until the motor comes to a full stop.

Safety is insured, the Clark Co. states, by simultaneous action of the directional



control-lever lock and a "dead-man" brake; the lever locks in neutral, and the brake, operating off the driveshaft, sets automatically when the driver leaves his seat. Another salient feature of this new truck is a separate motor which powers the hydraulic pump, and which is claimed to provide lifting and tilting power and speed well above user needs.

Lift heights are available in a range from the standard 84 in., with over-all height of 61 in. with forks down, to 130 in. and an over-all height of 84 in. with forks down.

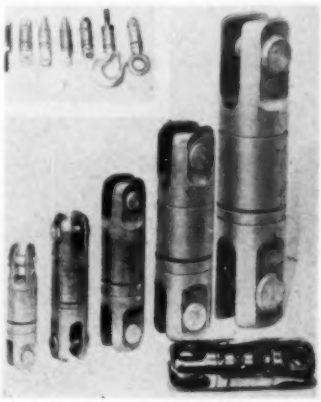
● Ball Bearing Swivels

A strengthened and enlarged line of "Miller Swivels" for eliminating wire line twist and kinking has just been announced by General Machine & Welding Works, 1100 East Second Street, Pomona, Calif.

General Machine's new swivel line consists of 15 different types of end connections and nine swivel capacities ranging from the "AA" model rated at 250-lbs. working load to the "H" model at 46,200-lbs. working. All Miller swivels have a safety factor of 5 to 1.

Miller swivels turn freely under maximum stress, removing all the kink and twist usually present when a wire line is heavily loaded.

These ball bearing, angular-thrust swivels are used in the construction industry for lifting concrete buckets and demolition balls, and for all other types of single line hoisting.



Here is the New Yardstick for Crawler Tractor Performance

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● **POWERFUL** . . . Newest, latest GM 2-Cycle Diesel Engine; Model 6-110. Plenty of POWER . . . for longer life, lower maintenance, increased production.

● **HYDRAULIC TORQUE CONVERTER DRIVE** that eliminates most gear shifting and keeps tractor working smoothly at higher average speeds.

● **SIMPLE UNIT ASSEMBLY** . . major assemblies removed and repaired or replaced without removing adjacent parts.

● **EXTENDED LUBRICATION PERIODS THROUGHOUT** . . . plus 1,000-hour periods on truck wheels, track idlers and support rollers with A-C's POSITIVE SEAL.

● **EVERY OPERATOR COMFORT** . . . seat, platform, controls, visibility . . . hydraulic finger-tip steering, self-energizing brakes, practically no gear shifting.

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With more grips than a wrestler

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A wrestler with exclusive right to use unbreakable holds would win every bout.

A similar advantage, responsible for its unequalled performance, is a feature of the Owen Grapple.

Its ingenious Patented principle of operation enables each tine, or prong, to dig in and grip independently of the other tines.

As a result the Owen Grapple gathers and grasps several rocks of varying size or holds in its unbreakable grip stone of tremendous sizes and fantastic shapes that could not possibly be handled by grapples of conventional design.

Get the Owen Grapple bulletin which proves these strong statements with many varied and interesting photos.

Owen Buckets and Grapples

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● Automatic Lubricator

The Delta Engineering Sales Co., 806 Louisiana Ave., Shreveport, La., has recently patented a device for automatically lubricating any make of lubricated plug valve from ½ in. to 20 in. in size. This new Delta automatic plug valve lubricator forces a measured amount of lubricant into the lubricating channels of the valve each time it is opened and

closed, and according to the manufacturer is fool-proof and positive in action.

The Delta lubricator, composed of three simple stainless steel parts attached without alteration, allows the valve to be opened and closed 50 to 100 times before the reservoir must again be filled. To do this, the hose connection of a Delta lubricant gun is snapped on the top fitting, the plunger handle is given a few strokes, and the reservoir is filled.

● Tractor Shovel

Model HE is the designation of a completely new Hough "Payloader" tractor shovel with ½-cu. yd. bucket capacity manufactured by the Frank G. Hough Co., 750A Sunnyside Avenue, Libertyville, Ill. The addition of the Model HE to the Payloader line makes five sizes of these tractor shovels available, with bucket capacities of 12 cu. ft., ½ cu. yd., ¾ cu. yd., 1¼ cu. yd. and 1½ cu. yd.

It has a full-reversing transmission with four forward and four reverse speeds, coupled with forward-reverse control separate from the regular shift.

Ball-bearing steering, hydraulic brakes, comfortable operator seating and operator location for full visibility of all operations are other features.

● Metal Safety Hat

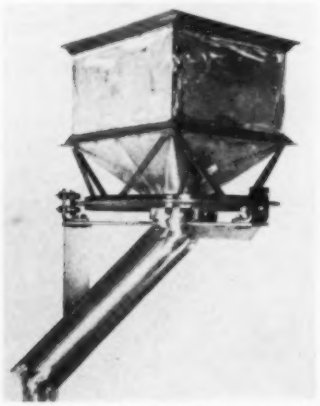
High impact resistance is built into a new 12-oz. aircraft grade aluminum alloy "Roughneck" safety hat according to the manufacturers, the E. D. Bullard

Company, 275 8th Street, San Francisco 3, Calif. The distinctive ribbed design, the Bullard Company's laboratory drop tests demonstrate, furnishes structural strength, while the crown remains resilient to absorb much of the impact of a falling object.

In development for two years, this safety hat incorporates a second impact-absorbing feature. The inner hat assembly is designed to absorb shock with its full-floating, six-point suspension hammock. Headbands and hammocks are fully adjustable to fit all head shapes and sizes. The entire assembly can be replaced without tools with slide action wedge-type fasteners.

● Swivel Spout

The Richardson Scale Company, Clifton, N. J., has announced a new dust-tight "Swivel Spout" designed to eliminate routing of batches by dusty swivels or conveyor plows. Increased scale flex-



ibility is reported obtainable by using the spout to chute pre-weighed discharges to different bins or stations, to deliver from a bin to several different scales, or to deliver pre-weighed discharges to two different delivery trucks.

Remote automatic positioning of the spout can be synchronized with other functions by means of a timer. The Swivel Spout is available with either manual or automatic controls.

● Tachometer and Cutmeter

The new portable MI200-F electric tachometer and cutmeter introduced by the Electric Tachometer Corporation, 2218 Vine St., Philadelphia 3, Pa., is said to assure accuracy of better than ± ½ of 1 percent of full scale value in measuring either surface speeds in f.p.m. or shaft speeds in r.p.m. It is claimed that this same accuracy is maintained at both low and high speeds over the entire range of from 0 to 25,000 r.p.m. Since generating and indicating instruments are separate, steady readings can be obtained even under adverse conditions. The MI200-F makes possible a continuous indication, so that speed changes or variations can readily be observed.

In many applications, such as in the

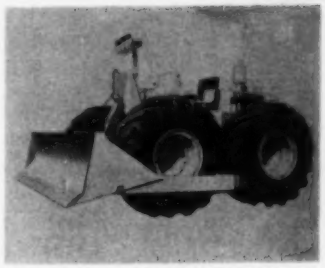
measurement of motor speeds, it is entirely practical to mount the indicator permanently in some convenient, remote location. The standard cable connecting the generator and indicator may be lengthened to as much as 500 feet. The tachometer is completely self-contained and requires no batteries or other external power source. It consists of a rugged, precision-built d.-c. magneto generator which produces a voltage directly proportional to the speed being measured, calibrated in conjunction with an easily-read laboratory type indicator having four overlapping speed ranges.

● Small Tractor Dozer

To meet the need for a four-wheeled tractor dozer to handle jobs which do not demand the use of the larger, standard size "Tournadozer", R. G. LeTourneau, Inc., Peoria, Ill., has introduced the smaller size "Super D" Tournadozer.

Some 3,500 lbs. lighter and equipped with a smaller capacity bowl than the "Super C" Tournadozer, the Super D is powered by a 122-hp. diesel engine. Capacity of the Super D's bowl is 1.8 cu. yds. The smaller model Tournadozer retains the advantage of high speed, having four speeds forward up to 19 m.p.h., with two reverse speeds, and can be equipped with the usual dozer accessories. Like the larger model, the Super D is mounted on big rubber tires.

The Super D is equipped with a "Tournamatic" transmission and air-synchronized, multiple-disc clutches. Steering is accomplished by controlling wheels on each side through the use of

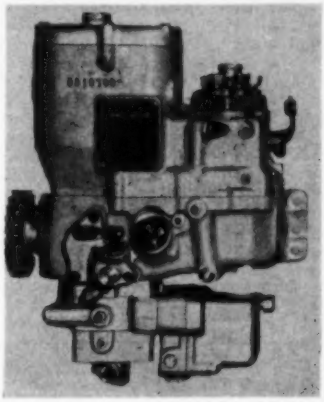


air-actuated multiple-disc clutches and brakes. The bowl is cable-controlled and is operated through an electric motor and gear reduction box.

● Lightweight Fuel Pump

A new refinement to the Cummins fuel system is a new fuel pump, 65 percent lighter in weight and 56 percent smaller in size, as announced by Cummins Engine Company, Inc., of Columbus, Ind.

Known as the "DD" (double-disc)



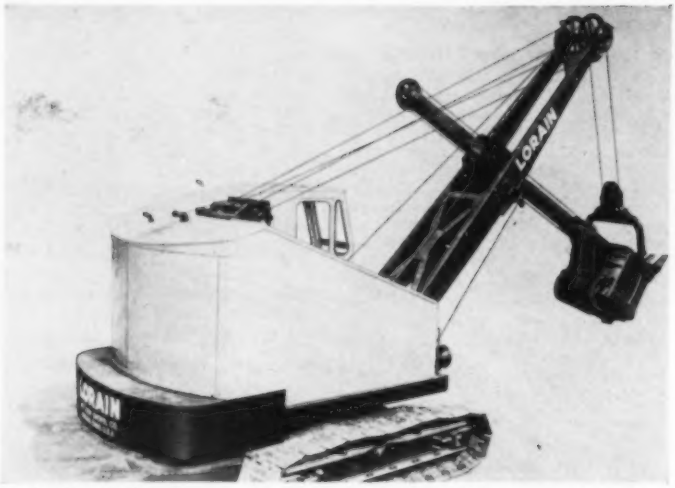
pump, the new unit is now offered as standard equipment on the 300-hp. model NHRS-600 and 275-hp. model NHS-600 Cummins diesels, and is available as optional equipment on other Cummins models. A tandem arrangement of the new DD pump is also standard on the larger Cummins diesels.

The design of the new DD pump enables unit replacement of the fuel pressure pumps, distributor discs, and governor assembly without removal of the pump from the engine, and according to Cummins, largely eliminates angular stress on governor and throttle linkage which, in turn, reduces wear on bearings and bushings.

● Centrifugal Clutch

Armstrong Products Company, Milwaukee, Wis., is now producing a centrifugal clutch for drives of ½ to 6 hp.

The clutch can be operated in either direction on direct or indirect drives. It is light in weight, simple in operation, low in cost, and easily serviced on the job. Slippage is not excessive, even at extremely high temperatures, the manufacturer states.



● ¾ Yard Shovel

The Thew Shovel Company, Lorain, O., has added a new shovel in the ¾-cu. yd. class known as the "TL-25."

This shovel features a removable turntable composed of several subassemblies to facilitate repairs and replacements. Other features include five identical clutches to control all operations; one-piece welded turntable bed; hook rollers on drop-forged brackets with central pressure lubrication; machine-cut internal ring gear; oil-enclosed machine gears; anti-friction bearings on horizontal power shafting and clutch friction drums; and power load lowering.

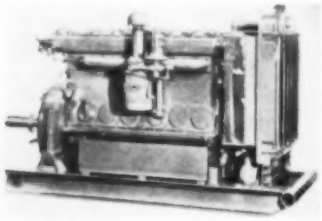
Boom equipment is interchangeable and provides a shovel boom with an independent cable crowd, an all-welded boom, a one-piece dipper stick, and a ¾-cu. yd. streamlined dipper. Special features include a precision boom-lowering device for variable speed, power-controlled boom lowering, swing brake, and boom stops. There is a third drum attachment for lifting cranes. The clamshell has a "Rud-o-Matic" tagline. The dragline features a "cable-miser" fairlead; and the hoe has a goose-neck boom and a streamlined "non-heeling" dipper.

Three crawlers are available with two-speed, chain-driven, oil-enclosed mechanisms. Twelve rubber tire carriers are also available. The moto-cranes may be converted into "dual control" machines, which are combinations of moto-crane and self-propelled.

● Dual Fuel Engines

A new line of heavy-duty engines, power units and generator sets capable of burning either natural gas or diesel fuel has recently been announced by the Murphy Diesel Company, 5307 W. Burnham St., Milwaukee 14, Wis. Employing the same basic construction as Murphy diesel engines, the new Murphy dual-fuel engines permit operation on either fuel merely by positioning a simple lever for the desired fuel.

According to the manufacturer, the Murphy, unlike most gas engines or gas conversion engines, is a heavy-duty engine utilizing the economical advantages of high compression combustion. It is claimed that the fuel system used insures a lean economical mixture of excess air and gas.



Ignition is accomplished by injecting pilot diesel fuel into the cylinder. The heat of compression ignites the gas-air mixture. A constant small quantity of pilot fuel is used (not over 14 percent for extreme operating conditions).

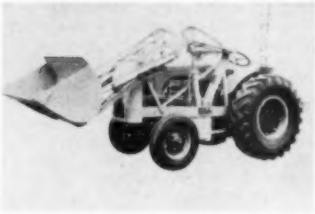
If operation as a full diesel is desired for continuous diesel service, the change-over can be made with no additional parts.

In areas where natural gas is available, it is estimated that fuel savings up to two-thirds over diesel operation can be achieved. For areas where gas is not now available, Murphy dual-fuel engines can be operated as full diesels for the present and immediately switched over to gas when it becomes available. Three models are now available, ranging from 135 to 180 hp.

● Redesigned Loaders

The Lull Manufacturing Company, 3612 E. 44th Street, Minneapolis, Minn., has redesigned and improved its line of "Shoveloaders" to give streamlined design, maximum vision, and faster operation.

The new models have larger hydraulic



pumps for faster raising, lowering, and dumping; redesigned bucket-control cylinders for faster control and better vision; and buckets with lower lips for easier, faster digging. New bucket sizes and types for loose materials, coal or snow, and concrete have been added. Lifting cranes, bulldozers, and other attachments are quickly interchangeable. Serviceability, performance, and safety features all have been improved, according to the company.

● Back Rip Scarifier

Preco, Incorporated, 6300 E. Slauson Ave., Los Angeles 22, Calif., is manufacturing back rip scarifiers which are mounted at the back of bulldozer moldboards.

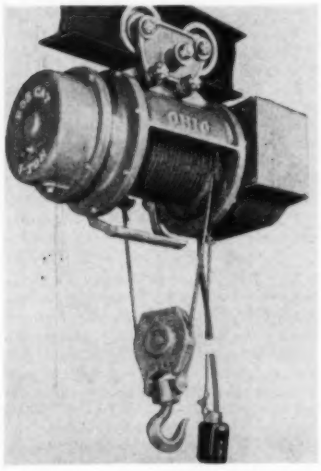
The scarifier consists of four curved shanks capped with lock-on replaceable teeth, each mounted separately. The teeth can be raised and pinned out of the way when not in use. They rip and loosen packed soil, black top, hard ground, cemented gravel, tufa rock, and roots, when the tractor is backing and float when the blade is moving forward.

trade notes

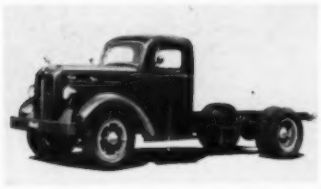
● Electric Cable Hoists

A new line of heavy-duty "Bob-Cat" electric cable hoists ranging in lifting capacity from ½ to 5 tons has been presented by the Ohio Electric Mfg. Co., 5900 Maurice Ave., Cleveland, O. Originated and designed by Lisbon Hoist and Crane Company, the Bob-Cat hoist has its motor totally enclosed within the cable drum, a feature which is said to reduce over-all dimensions and weight. In addition, the motor is fully protected against weather, moisture, dust, and corrosive atmospheres.

Gear reduction is accomplished by means of a double internal (epicyclic) gear train which incorporates two Weston-type load brakes. The load hook oscillates and swivels on roller bearings and is suspended on a 5/16-in. preformed plow steel cable which can be replaced without disassembling any part of the hoist.



Designed for operation on 220-, 380-, 440- or 550-volt 3-phase, 60-cycle current, the Bob-Cat hoist is furnished with either pendant rope control or push-button control on pendant cable. A transformer in the electrical supply line cuts voltage at the control to 110 volts.



Mack Trucks, Inc., recently unveiled a new line of "Golden Anniversary" Model A trucks. All completely Mack-built, Mack's midcentury models also have a new engine to power them, Mack's own "Magnadyne". The Golden Anniversary A Models range in size from 17,000-lbs. (g.v.w.) for medium-duty hauling, to 40,000-lbs. (g.c.w) in the tractor-semi-trailer model for heavy-duty highway work. Mack Trucks, Inc., 350 Fifth Ave., New York 1, N. Y.

Walter F. Garlow was appointed sales promotion manager of The Howe Scale Company, Rutland, Vt., according to a recent announcement.

Mr. Garlow was advertising manager for the Hewitt Rubber Division and the Hewitt Restfoam Division of Hewitt-Robins, Inc., Buffalo, N. Y., before joining the Howe organization.

Retirement of Delbert Kay, advertising manager of the Nordberg Manufacturing Company, Milwaukee, Wis., under the company's retirement plan has been announced. J. D. Grace, manager, advertising and sales development department, has assumed the advertising duties.

A. W. Smythe, vice-president and general manager of The Thew Shovel Company, Lorain, O., announced the following changes: M. B. Garber becomes director of sales; J. T. Cushing, sales manager; Robert Maynard, export manager; Q. J. Winsor, manager of development sales.

Harold A. Montag, assistant to the president, Joy Manufacturing Company, Pittsburgh, Pa., has been appointed as a consultant to the Department of the Interior, Secretary Oscar L. Chapman announced recently.

Mr. Montag, who is on loan to the government for the Defense Program, will advise on the equipment and supplies needed for assuring maximum output of mines.

Howard Cooper

Howard Cooper, manager of Technical Service of Sinclair Refining Company, New York, was elected president of the National Lubricating Grease Institute at the annual meeting of that organization held recently in Chicago.

Mr. Cooper was first elected to the board of directors of the institute in 1946, and since then has served on numerous committees, including the membership and program committees. During the last year, Mr. Cooper has served as vice-president.

Mr. Cooper began his connection with the petroleum industry before the first World War. He has been associated with Sinclair Refining Company since 1923, except for 3½ years during World War II, when he served in the Petroleum Administration for War as section chief in the Marketing Division. He is a member of the A.S.M.E., S.A.E., A.S.T.M. and A.S.L.E.

H. C. Lull

Herbert C. Lull has been appointed sales manager of Lull Manufacturing Company, Minneapolis, Minn., according to an announcement made by L. H. Lull, president of the company.

As sales manager, Mr. Lull will direct the sales promotion of all products manufactured by Lull Manufacturing Company, which builds "Shovel-loaders," "Tilting-Tower Universal" loaders, fluid-driven sweepers, shoulder maintainers, "Lulldozers," "Travelloaders," and fork-lift trucks.

Construction has started on a $350,000 plant expansion of the Wayne Division plant of Gar Wood Industries, Inc., in Wayne, Mich.

The Corporation's plant in Highland Park, Mich., will be moved to the Wayne plant. It is estimated that when the expansion is completed, the Corporation will double its present employment in the Wayne Division plant.

Products now being manufactured at the Wayne plant include hydraulic hoists, truck winches, truck cranes and cable control units. The products being manufactured at the Highland Park plant, and which will be transferred to the Wayne plant upon completion of the expansion program, are dump bodies, both light and heavy duty; rock and quarry type bodies and the load-packer refuse collection unit.

Pierce J. Fleming has been appointed manager of Mack-International Motor Truck Corporation's Off-Highway Sales Division.

Also announced was the appointment of John Walker as manager of the Off-Highway Sales Engineering Division. Both Mr. Fleming and Mr. Walker will make their headquarters in the company's home office, Empire State Building, New York City.

The Claremont Paper Mill, Claremont, N. H., has been acquired by the Bemis Bro. Bag Company. W. A. Kirn Sr., who has headed Claremont for many years, will remain in charge as manager for Bemis. The Claremont Paper Mill is equipped to produce kraft paper specialties which apply to the bag manufacturing industry.

The Deister Machine Company, Fort Wayne, Ind., has announced the appointment of the Indiana Equipment Company as distributor for Diester vibrating screens in all of Indiana except the Calumet area. Indiana Equipment maintains show rooms and service facilities in Indianapolis at 1244 West 16th Street, and in Fort Wayne at 1902 South Harrison Street.

Announcement is made of the formation of the Alloy Steel Corporation, 7501-7 Union Ave., Cleveland 5, O., using the trademark name "ASCO." The company stocks a line of maintenance repair parts and accessories, including two sizes of ASCO Grouser steel for crawler type tractors, tractor bolts and nuts, high-carbon cap screws, and bucket seat cushions for tractors and other similar equipment.

The Jeffrey Mfg. Co., Columbus, O., which manufactures materials-handling and processing equipment, announces the removal of its district office in West Virginia from Huntington to 403 City Avenue, Beckley. E. H. Hebden is district manager.

Election of F. S. Nickerson as vice-president of Mack-International Motor Truck Corporation and his appointment as manager of the company's Central Division sales territory has been announced. Mr. Nickerson joined Mack in 1945 as sales representative in its Atlantic Division. The following year he was appointed manager of the company's Baltimore, Md., direct factory branch, a post he relinquishes to take up his new duties. Mr. Nickerson will make his headquarters in Mack's Chicago office.

Wallace W. Mojden, formerly chief engineer of the Eriez Manufacturing Company, Erie, Pa., is now a sales engineer with Mills-Winfield Company, of Chicago, distributors of Eriez permanent non-electric magnetic separators. Mr. Mojden is the co-inventor of the "Eriez Micro-Magnetic Separator." In Chicago, he was associated with the American Polytechnic Research Laboratory and General Electric X-Ray.

The annual Putman Award for "the best use of industrial advertising and the best documentation of such use" was presented to Raymond P. Wiggers, advertising manager of The Frank G. Hough Co., Libertyville, Ill., manufacturers of materials-handling equipment, and to its agency, Ervin R. Abramson Advertising, Milwaukee, Wisconsin, at the National Industrial Advertisers Association Convention in Los Angeles.

John A. Sutherlin has been appointed sales manager of the Chase Bag Company's New Orleans Branch. Mr. Sutherlin became a member of the New Orleans territory's sales force immediately following his tour of duty during World War II.

His new assignment will include eight states in the South and Southeast, with New Orleans as his headquarters.

The Flexible Steel Lacing Company, 4607 Lexington Street, Chicago, belt fastener manufacturers, announces the appointment of Lester B. Coleman as New England and New York State representative. He was formerly associated with a New England mill supply distributor.

Expansion of Federal Motor Truck Company's sales organization was recently announced. Walter L. Hayes, formerly head of the company's Eastern field organization, has been promoted to assistant general sales manager, with headquarters at Detroit.

Harry L. Norton has been named truck distribution manager and will serve on Mr. Hayes's staff. W. A. Knechel has been elevated to the post of assistant general sales manager of the Eastern territory. F. Jule Weiland has been appointed factory sales representative for Wisconsin. He will direct dealer relations and sales promotion programs in Wisconsin, upper Michigan, and northeast Minnesota.

Arkell & Smiths, multiwall paper bag manufacturers, have announced the appointment of R. P. Kessler as packaging engineer. He will make his headquarters at Canajoharie, New York, and will be in charge of the A. & S. packaging laboratories maintained there.

Westinghouse Electric Corporation has appointed Louis R. Botsai manager of the Motor and Control Division, Buffalo, N. Y. Mr. Botsai has been manager of the Gearing Division for the last nine years.

The Heil Company, Milwaukee, Wis., has appointed Robert G. MacDonald director of industrial relations. Mr. MacDonald was formerly commissioner of the U. S. Mediation and Conciliation Service in Milwaukee.

Link-Belt Company, Chicago, Ill., has established a separate public relations department, headed by Harlan B. Collins, secretary of the company, and Russell B. Kern, editor of the *Link-Belt News*.

Bertram V. Jones has been appointed executive assistant advertising manager and John F. Kelly, assistant advertising manager.

The Whiting Corporation, Harvey, Ill., manufacturers of industrial equipment and machinery, has adopted a new distributing policy for its Merchandise Sales Division, according to S. H. Hammond, president.

The division under the management of A. E. Bottenfield, vice-president, has reorganized and expanded the line of materials-handling equipment to include electric chain hoists, material conveyor systems, overhead monorail and light crane systems, and hoist-type cranes.

Recent General Electric Company appointments include the naming of Francis E. Fairman as general sales manager of Large Apparatus Divisions, and Arthur W. Bartling as general sales manager of the Small Apparatus Divisions.

Carl E. Johnson, president of Sterling Electric Motors, Inc., Los Angeles, Calif., was recently elected board chairman, and Earl Mendenhall was elected president.

The following changes in the Quaker Rubber Corporation, a division of H. K. Porter, Philadelphia, Pa., was announced by T. M. Evans, president: J. R. Keach, general manager, is now director and vice-president; G. C. Johnson, general sales manager, has been voted a director; F. A. Rehorst is secretary; and V. P. McNichol is assistant treasurer.

Frank L. Jones, secretary and assistant treasurer, has retired from these duties.

The Gould Storage Battery Corporation, Trenton 7, N. J., has revised its *Battery Technology Handbook*. The second edition has 40 pages giving technical instructions and engineering data on the use and care of motive-power storage batteries. A new section was added on the theory of the acid-lead battery. Battery users and maintenance men may obtain copies from the company.

Roy C. Ingersoll, previously vice-president of Borg-Warner Corporation, was elected president, to succeed C. S. Davis, president of the corporation for the last 21 years. Mr. Davis was elected to the newly-created office of chairman of the board.

G. A. Shallberg, previously executive vice-president of Borg-Warner, was named chairman of the executive committee. Mr. Ingersoll, in addition to his duties as president, will assume the duties formerly assigned to the office of the executive vice-president.

A new vice-president of Borg-Warner also was announced. He is A. P. Emmert, of Muncie, Ind., president of the corporation's Warner Gear Division, a position which he will continue to hold.

Nils Walter Swenson was recently appointed assistant manager of branch sales for the Mechanical Goods Division, United States Rubber Company. Mr. Swenson was manager of mechanical goods sales for the company's Buffalo, N. Y., branch. He will make his headquarters at the company's New York offices in Rockefeller Center.

Tractor and Equipment Company, 3515 W. 51st Street, Chicago, Ill., has contracted to distribute the Jones line of bantam weight cranes manufactured by the K & L Steelfounders & Engineers, Ltd., in England.

Cranes will be shipped from England without motor, boom, counterweight, and some other components, which will be purchased or fabricated and installed by Tractor and Equipment Company. Special advantages cited are fine workmanship, low price, and low operating cost.

John L. Busey has been elected vice-president in charge of marketing policy for the General Electric Company, Schenectady, N. Y. William V. O'Brien was elected a commercial vice-president and assistant manager of marketing policy.

Charles R. Pritchard was elected president and a director of G-E Supply Corporation, Bridgeport, Conn.

Sales of Koehring, Parsons and Kwik-Mix construction equipment in northern Calif. and Nev. will be handled from the Koehring Company's West Coast Division office in Stockton, Calif., it was announced by Koehring officials. Leo J. Lamley, formerly Koehring district representative for the West Coast area, will be in charge of sales for all products produced by Koehring and the two subsidiary companies. A complete stock of repair parts and service will be maintained in Stockton.

Formation of Caterpillar Tractor Co., Ltd., a wholly owned British subsidiary, was announced by Louis B. Neumiller, president of Caterpillar Tractor Co., Peoria, Ill.

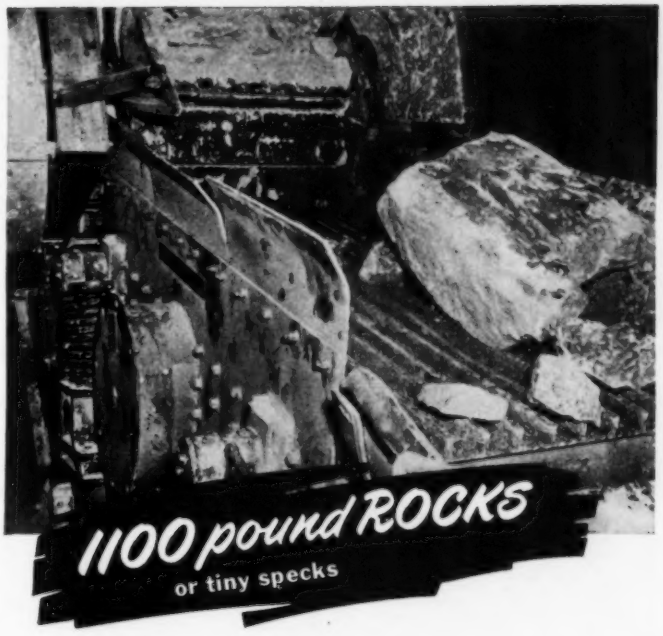
The new company will engage in the business of procuring, inspecting, storing and shipping British-made genuine "Caterpillar" parts to the company's dealers in United Kingdom and other countries.

Named to head the new English organization is Wallace J. Bornholdt, purchasing agent for Caterpillar, who will be managing director. He will be aided by Wayne H. Becker, parts control manager, who is to become merchandise manager of the subsidiary, and Wayne R. Thomson, planning staff engineer, selected to head up the technical and inspection department.

W. C. Snyder, Jr., vice-president and general manager of the Metallurgical Department of Koppers Company, Inc., was named president of Freyn Engineering Company, a Koppers subsidiary.

Gordon Fox, vice-president of Freyn, was named executive vice-president and appointed to the Board of Directors to fill the unexpired term of J. O. Shorley, deceased.

Appointment of Kenneth Bassett as supervisor of sales promotion, Dodge Manufacturing Corporation, Mishawaka, Ind., was announced by Ralph Hanes, director of advertising.



.. Hewitt-Robins Vibrating Screens Process Them All!

Take a look at that big brute of a machine. It's a vibrating screen—a Hewitt-Robins Heavy Duty Scalper.

The big rock you see on its deck is a 3 x 2 x 1½ lump of ore weighing about 1100 pounds. The Scalper handles loads like this at 1000 tons an hour. Yet, it absorbs those loads—and its own vibration—so completely that a coin placed on edge on the base beams will stand up without toppling over *while the machine is running!*

The same company that makes this big brute also makes a small screen called a Ceramic Slip Lawn. This lawn is so precise in action, so effective in operation, that it finds and removes tiny specks of impurities—about ½ pound in every ton of material—from clay slip for pottery plants.

Think of that range—from 1100 lb. rocks to tiny specks! It's the best proof of all that Hewitt-Robins can satisfy *your* vibrating screen demands!

Just look at these facts: Hewitt-Robins originated the circle-throw principle for vibrating screens. Hewitt-Robins created the elliptical throw. Hewitt-Robins pioneered in both 4-bearing and 2-bearing vibrators. Hewitt-Robins introduced the full-floating principle of vibration-absorption.

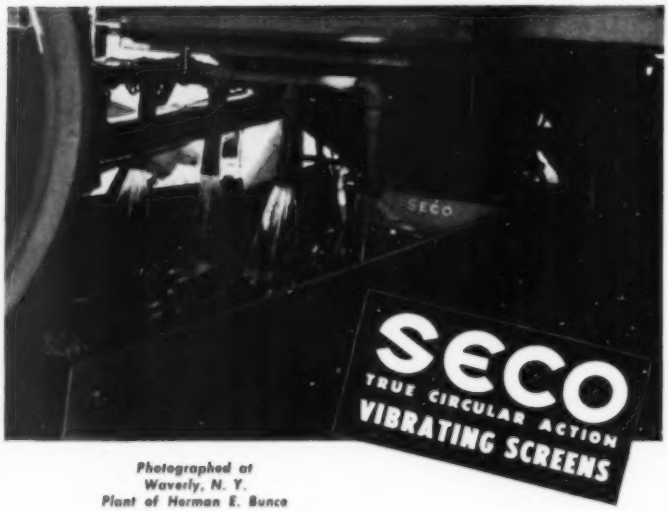
Whatever you want in vibrating screen equipment, you can *safely* rely on Hewitt-Robins. Tell us your needs; we will supply the answer. Write to Robins Conveyors Division, 270 Passaic Avenue, Passaic, N. J.

HEWITT-ROBINS
VIBRATING SCREENS

HEWITT-ROBINS HR **INCORPORATED**

BELT CONVEYORS *(belting and machinery)* • BELT AND BUCKET ELEVATORS
CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS
FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS
RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS
TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

PASSING EVERY SCREEN TEST...



Photographed at
Waverly, N. Y.
Plant of Herman E. Bunce

1 ACCURATE SIZING

The sharp action of a Seco forces the load through the meshes and the natural conveying action quickly carries the oversize into the discharge chute.

2 LARGE TONNAGES

The controlled true circular motion of a Seco vibrating screen makes every inch of screening surface equally effective — thus maintaining capacities.

3 SMOOTH OPERATION

Seco's exclusive patented construction controls the true circular action of the screen in operation. Result: *no vibration* is transmitted to the supporting framework.

4 LONG LIFE

Many Seco screens are in their eleventh, twelfth and thirteenth years of efficient service. Seco controlled true circular action means less stress on shaft and moving parts.

5 TROUBLE-FREE PERFORMANCE

Seco advanced engineering *plus* Seco high standards of quality in materials and workmanship pay off in greatly reduced maintenance on the job. . .

There's a right Seco for any screening job from ag-lime to rip-rap. Send for Catalog No. 203, Dept. L.

SCREEN EQUIPMENT CO., INC.
1752 WALDEN AVE. BUFFALO 21, NEW YORK
In Canada, United Steel Corp., Ltd., Toronto, Ontario

The Ponsford-Moos Equipment Company, 516 San Francisco Street, El Paso, Tex., has been appointed exclusive sales representative in Panama, Costa Rica, Nicaragua, El Salvador, Honduras and British Honduras for the Eriez Mfg. Company, Erie, Pa., producers of magnetic equipment.

This firm, which has been serving Eriez in northern states of the Republic of Mexico since the beginning of the year, handles all types of Eriez magnetic separators.

The appointment of H. J. Hunkele Jr. as assistant manager of the sales engineering division, Caterpillar Tractor Company, Peoria, Ill., was announced by H. H. Howard, director of sales.

In addition to having worked as district representative in the Eastern Sales Division, and more recently as special representative in the Sales Development Division, Mr. Hunkele has a varied background of other field experience.

Fairbanks, Morse & Co., Chicago manufacturers, and The Canadian Fairbanks-Morse Company Limited of Montreal have recently entered the Canadian railroad diesel locomotive field through the purchase of a controlling interest in the Canadian Locomotive Company of Kingston, Ontario, the oldest firm of its kind in Canada.

L. J. Lange, International Harvester Company, was appointed industrial power product specialist of that company, as announced by A. J. Peterson, manager, general sales department.

He will be concerned with the design and sale of industrial wheel and crawler tractors, and power units. Mr. Lange succeeds S. L. Siegfried in this capacity.

Election of Paul H. Davey Jr. as vice-president in charge of production of the Davey Compressor Company, Kent, O., was announced recently by Paul H. Davey Sr., president. Mr. Davey Jr. has been production manager of the Davey plant for the last two years. Previously he had held a number of other positions in the Davey organization.

Arkell & Smiths, manufacturers of paper bags, have appointed W. E. Noble as assistant to Howard C. Peterson Jr., general sales manager. Mr. Noble was formerly associated with The Borden Company. His headquarters are at Canajoharie, N. Y., where he will coordinate the customer service and market development work of the A. & S. sales department.

Ralph L. Johnson, president of the H. O. Penn Machinery Company, has announced the appointment of R. E. Reed as sales manager of construction equipment. As distributors of Caterpillar tractors, and other products, Bucyrus-Erie shovels, T. L. Smith concrete mixers and a wide line of construction machinery, the H. O. Penn Machinery Co. has twenty-six sales representatives who will be under the direction of "Ed" Reed.

legal decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Damages vs. Compensation

Modern higher courts consistently hold that an employee cannot recover damages from his employer for an ordinary injury, if the employer has compensation insurance under the State Workmen's Compensation Act. Otherwise the employee may sue and receive damages from his employer.

For illustration, in *Dezendorf v. Manor*, 230 S. W. (2d) 390, it was shown that an employee named Manor sued the Dezendorf Marble Company for damages for injuries received during the course of his employment, for loss of earnings, and for pain and suffering. The testimony showed that a fellow employee backed a truck into and upon Manor, causing the injuries complained of. Since the Dezendorf Marble Company had no insurance under the State Workmen's Compensation Act on its employees, the higher court awarded Manor $2,000 damages, saying:

"The amount of the award is not thought to be excessive."

Oral Lease Void

All higher courts consistently hold that an oral or verbal lease of real estate for more than one year is *void*.

For example, in *White Company*, 45 S. E. (2d) 637, it was shown that a company leased a building for 5 years under an oral contract. Soon afterward the landlord notified the company to vacate the premises.

In subsequent litigation the officials of the company proved that the landlord had verbally promised a 5-year lease. However, the higher court held the lease void saying:

"A lease contract for more than one year is void unless in writing and signed by both the lessor and leasee."

Failed to Cash Check

The seller of nonmetallic materials can collect the full balance due on the purchase price, irrespective of delay or negligence of the seller in failing to cash a check given by the buyer as payment. This law was established by a higher court in the late case of *Scott-Smith Company, Inc. v. Rajeski*, 70 Atl. (2d) 454.

The testimony in this case showed that at the time of a sale the purchaser paid $900 and gave the seller a check. For some reason the seller filed away the check and never presented it for payment. Several months later the seller sued the purchaser for the balance due on the account. The purchaser defended the suit, claiming that delay of several months in presenting the check for payment forfeited the right of the seller to collect payment.

The higher court refused to agree with this argument and ordered the purchaser to pay the full balance due on the purchase price.

Quarry Company Held Liable

Generally speaking, a person who sustains an injury in an automobile collision cannot recover damages unless he proves positively that his injuries resulted from negligence of the party he sued. However, the jury may decide uncertain cases.

For illustration, in *Cumberland Quarries, Inc. v. Gibson*, 229 S. W. (2d) 978, the testimony showed facts as fol-

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lows: The Cumberland Quarries operates a quarry and furnishes crushed stone for concrete at a dam. The stone is carried by truck from the quarry to the dam over a black surface road about 16 feet wide. One morning shortly after midnight one Gibson was riding in a passenger automobile over the road. As he passed over a slight rise, a point where the road was straight for a considerable distance, he noticed a quarry truck parked on the left side of the road. The truck was headed north toward the dam; its lights were "on bright." Another quarry truck was traveling in the same direction as the passenger car and stopped on the right side of the road near the other quarry truck. The driver of the passenger car did not see the last quarry truck, although it had good tail lights. The passenger car crashed into the rear of the quarry truck, seriously injuring Gibson, who sued the Cumberland Quarries for damages. The jury awarded Gibson $4,000 damages. The higher court approved the verdict, saying:

"Under all the testimony the question was one to be determined by a jury."

Two Companies Have Easements

According to a recent higher court, a company's gas, oil, or water pipe line will be protected against damage, irrespective of other holders of easements or mineral rights of the land in which the pipe is laid.

For example, in *East Ohio Gas Company v. James Brothers Company*, 85 N. E. (2d) 816, this question was presented to the court. If a gas company has a right of way for laying and maintaining a gas pipe line, and another company has "mineral" rights to remove sand and gravel from the land, can the gas company obtain an injunction to prevent damage to its pipe line. The answer is yes.

In this case it was shown that a gas company had a right of way 15 feet wide through private property. A mining company owned *all* mineral rights on the property.

The higher court held that since the mining may seriously endanger the gas pipe line, the mining company should be enjoined from making excavations and conducting any mining operations which may damage the pipe line.

Recently a reader wrote as follows: "Our company purchased machinery on a 'conditional' sale contract. We paid $925 down when the contract was signed and agreed to pay $243 per month until the full price was paid. The contract has a clause that the 'legal title' to the machinery remains in the name of the seller until we pay the full contract price. Another clause in the contract states that if we miss a single payment, the seller can repossess the machinery and keep all payments we had made in the past.

"The machinery was defective and did not operate according to the manufacturer's guarantee, and after several months we stopped making payments.

Due to the fact that the machinery was defective, we suffered loss of profits we would have earned if the machinery had not been defective. Our questions are: Can we prevent the manufacturer from repossessing the machinery and forfeiting our past payments? Can we sue the manufacturer for damages based on our financial losses due to his failure to furnish us machinery equal to his guarantee? The manufacturer's lawyer claims that we cannot sue for damages because at no time had the title to the machinery passed to our company. What are our legal rights in this matter?"

According to a recent higher court this company can sue the manufacturer for damages although under the terms of the conditional contract of sale the title in the machinery remained in the manufacturer.

Also, the manufacturer cannot repossess the machinery and keep past payments made by this company if the testimony showed that the company or purchaser stopped further payments because the manufacturer breached his contract.

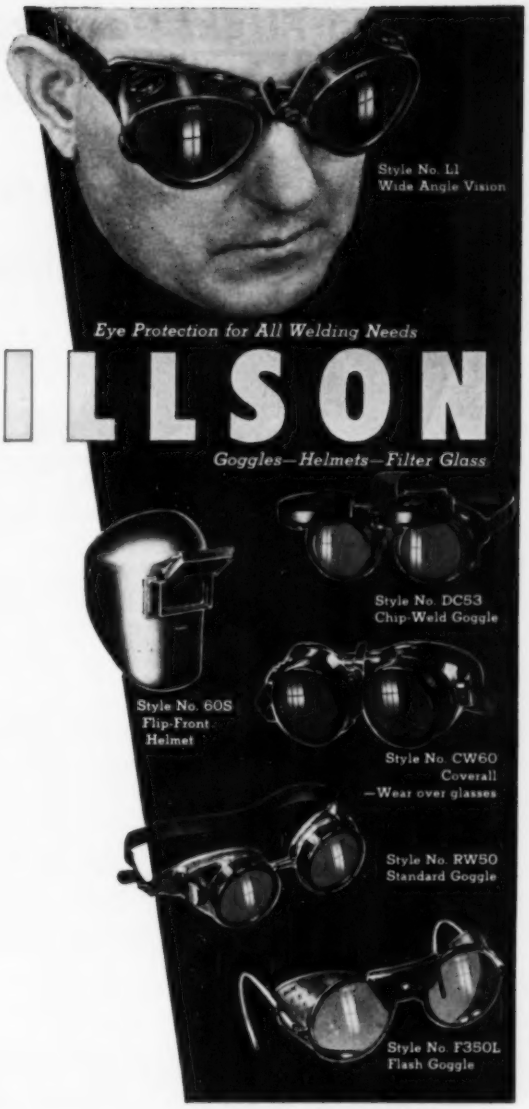
For example, in *Pioneer Engineering Works, Inc., v. McConnell*, 212 Pac. (3d) 641, it was shown that a manufacturer sold to one McConnell a plant to crush, wash, and grade gravel and sand at a price of $34,211. The machine was sold on a conditional sales contract, the seller retaining title and the right to terminate the contract and repossess the property upon the failure of McConnell to make payments of the installments of the purchase price. After the first payment McConnell refused to make any further payments on the ground that the machine did not do the work that it was warranted to do. McConnell contended that the manufacturer had breached a clause in the contract, as follows:

"The seller warrants the above plant will produce in 24 hours 2,666 yards of aggregate sand and gravel which will be properly washed and screened . . ."

In subsequent litigation the manufacturer argued that McConnell could not sue for damages because under a conditional sale contract the title to the machinery remains in the seller until fully paid for by the purchaser. The higher court refused to agree with this contention saying:

"A conditional buyer takes possession and uses the machinery at once and if it does not do what it is warranted to do, he suffers an immediate injury. In the instant case, assuming that there was a breach of warranty, the injury immediately arose and the damage was done to this defendant (McConnell) at the time that the gravel washing plant failed to produce gravel in accordance with the terms of the contract. For this damage the defendant (McConnell) was entitled to recover as soon as the detriment occurred. . . . He (McConnell) had a right to introduce evidence to prove that there had been a breach of that warranty and to show the extent to which he had been damaged."

Also, the manufacturer argued that he was entitled to repossess the machinery from McConnell at once. McConnell admitted that the machinery was sold on a



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conditional sale contract and that the contract provided that the manufacturer might terminate the conditional sales contract and declare the whole contract due and payable, if he missed a single payment.

It is interesting to observe that the higher court held:

"Under these facts, notwithstanding the provision in the contract that the seller was to be wholly discharged of liability under the warranty in case the buyer failed to pay for the goods ordered, if this failure was caused by the action of the plaintiff (manufacturer), then nonperformance was excused."

Must Prove Negligence

Generally speaking, a property owner who sues a company for damages caused by blasting must prove that the damage was caused by *negligence* of the company's employees who did the blasting; otherwise the company is not liable.

For example, in *O'Regan v. Verrochi*, 90 N. E. (2d) 671, it was shown that several blasts were set off 125 to 150 ft. from a house. Soon afterwards various cracks were observed in the foundation walls, in the cellar and in the ceilings and side walls of rooms in the house, The property owner sued the company whose employees set off the blasts. This higher court held:

"Where, as here, the plaintiffs (property owner) are not contending that their property was damaged directly by stones or other debris being cast upon their premises but contend that the damage was due to concussion or vibrations generated by the blasting, the burden was upon them to prove that the damage resulted from the defendant's (company's) negligence."

Industrial Sand Freight Rates

According to a recent higher court, it is not unlawful or illegal for a Public Service Commission to establish higher freight rates on industrial sand than rates on common sand.

For example, in *Allegheny Corporation v. Pennsylvania Public Utlity Commission*, 70 Atl. (2d) 475, the testimony showed that the freight rates on industrial sand were considerably higher than the freight rates on common sand. The higher court held the two rates enforceable.

Law of Navigable Streams

Recently a reader wrote as follows: "I have a legal problem on my hands. Please assist me by giving me the law. First, I would like to know this: If a stream is navigable only a few days or weeks each year, does the stream come under the laws relating to navigable streams? Second, suppose that no boats navigate the stream, is it a 'navigable stream'? Third, what is the legal status of water from a navigable stream which flows over my land so shallow that it can not be used for navigation?"

See the late case of *Munning v. Wisconsin Commission*, 38 N. W. (2d) 712.

This court laid down important law, as follows: First, a stream is legally "navigable" if the stream has *periods* of navigable capacity ordinarily recurrent from year to year and continuing long enough

to make the stream usable either for short or long periods. Second, the owner of submerged soil of a running stream does not own the running water. Third, the rights of the general public to waters of a navigable stream are boating, bathing, fishing, hunting, and recreation. Fourth, trespassers or the general public cannot have access to a navigable stream covering privately owned lands.

For comparison, see *Willow River Club v. Wade*, 76 N. W. 273, 42 L.R.A. 305. This court held that it is not essential that the capacity of a stream for navigation be continuous throughout the year to make it navigable or public. It is sufficient that a stream has periods of navigable capacity ordinarily recurrent from year to year and continuing long enough to make the stream usable as a highway.

And in *Falls Mfg. Company v. Oconto River Imp. Company*, 58 N. W. 257, the court held that if a stream is used for floating logs or other merchandise to the market during the spring freshets, which normally lasts six weeks, the stream *is* legally navigable.

Also, shallow running water from a navigable stream is subject to laws relating to navigable waters, yet this rule of law is *not* applicable if the water is standing, although originally it came from a navigable stream. In other words, standing water belongs to the owner of the private land and is not under jurisdiction of a state. See *Delta Fish & Fur Farms v. Pierce*, 234 N. W. 881.

Not Double Taxation

According to a recent higher court, an imposition of a "power" tax based on the power generated by engines of a contractor's dredges, in addition to an occupational license tax is not "double taxation."

For example, in *state ex rel, Fontenot, Collector of Revenue v. Standard Dredging Corporation*, 43 So. (2d) 909, it was shown that the State of Louisiana passed a "power" tax statute. In other words, the state imposed a power tax on a dredge operator who also paid an occupational license tax. The latter tax was on the basis of gross receipts or money derived from the operation of the dredge.

The higher court held the law valid although it imposed a tax on the power used to operate the dredging machinery, and although the owner of the dredge paid an occupational tax, these two taxes were *not* invalid as double taxation.

Another important point of law decided by this higher court is that a tax on power used to operate a dredge in navigable waters is not invalid as an interference with a federal license to navigate waters of the United States.

Independent Contractor Solely Liable

Considerable discussion has arisen from time to time over the legal question: How can a corporation avoid liability for injuries to employees and customers caused by defective equipment? The answer to this question is: If a corporation employs an "independent contractor" to do a job, it is not liable if, through negligence of the contractor, an injury to an employee, customer, or real property results. In other words, the independent contractor is solely liable, thereby relieving the corporation from liability.

For illustration, in *Allison v. Ideal*, 55 S. E. (2d) 281, it was shown that a corporation converted its coal-fired boilers to gas-fired. This work of conversion was accomplished by a contractor who was paid a flat contract price for the job. Not long afterward an employee discovered that gas was escaping because he heard a hissing sound. A few moments thereafter the escaped gas was ignited through some unknown means. Considerable damage was done to employees and nearby private property.

The higher court refused to hold the corporation liable, and said:

"In view of the considerations which have been stated, the employer (company) cannot be justly subjected to liability for the independent contractor's negligence."

Stolen Lanterns

Considerable discussion has arisen from time to time over the legal question: If a contractor uses care and places lighted lanterns on a sidewalk barrier, is the contractor liable in damages for injuries sustained by pedestrians if unknown persons stole the lanterns from the barrier? According to a recent higher court the answer is yes.

For example, in *Bertolozzi v. Progressive Concrete Company*, 212 Pac. (2d) 910, it was shown that a city ordinance provides that every contractor who per-

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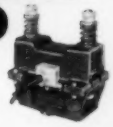

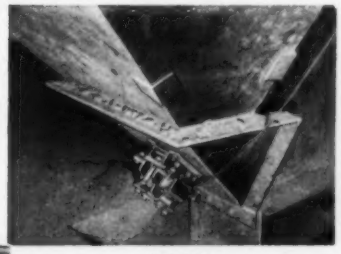

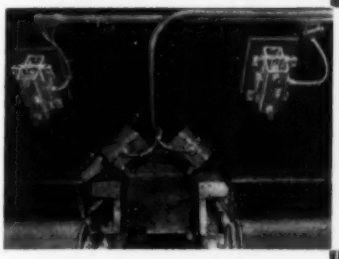

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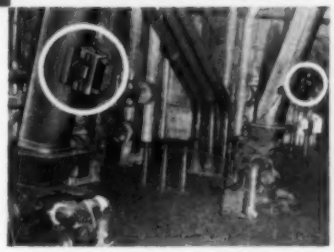

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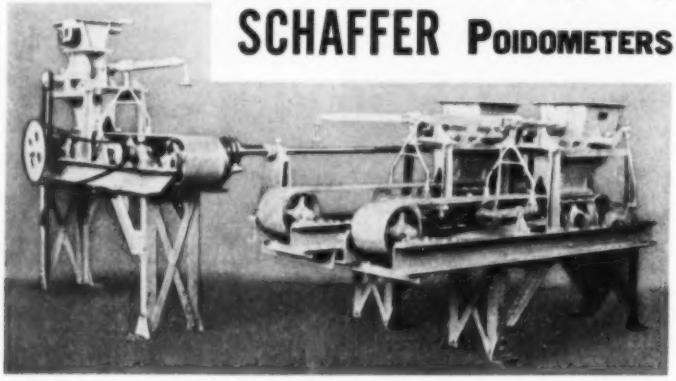

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forms work dangerous to pedestrians must erect and maintain a substantial barrier and that reflectors or lanterns "shall properly warn persons of said dangerous condition."

One night a pedestrian sustained serious injuries when he walked into a framework of boards placed by a contractor around an area of freshly poured concrete on a sidewalk. The mishap occurred in the night, and the evidence showed that the contractor had failed to place "reflectors" on the barrier, but he had placed lighted lanterns on the barrier. However, someone had without knowledge of the contractor stolen the lanterns. In view of this testimony, the higher court held the contractor liable in damages to the pedestrian, and said:

"Where a statute or ordinance is clear on its face there is no room for extrinsic evidence of its meaning. . . . There was some evidence that on previous occasions lighted lanterns left at barriers on the streets by defendant (contractor) had been removed by children or others. . . . The mere placing of a lantern, lighted or unlighted, 'at or near the barricade' would not excuse defendant (contractor), even if it remained there, unless it was lighted and placed at the end of the barricade from which the injured person approached, so as to be visible to her in the exercise of ordinary care."

Irrelevant Testimony

Under no circumstances will a higher court allow either party involved in a law suit over a contract to introduce irrelevant testimony not designed to prove the exact legal differences based between the parties.

For example, in *Harris v. Williams*, 43 So. (2d) 364, it was shown that a company made a verbal contract to sell and deliver gravel ballast to one Harris. Later the parties disagreed as to the contract price and one party attempted to introduce testimony to show that he conducted stripping operations at a loss for the purpose of proving that he would not have undertaken the job unless the price he contended was correct.

The higher court refused to admit this testimony which showed a loss of the stripping operations because this testimony had nothing to do with the actual contract price.

Custom Not Law

Considerable discussion has arisen from time to time over the legal question: Can a custom or agreement between operators of motor trucks relieve a driver for liability for a collision caused by his failure to obey lawful traffic rules? The answer is no.

For example, in *Stephens v. Cutsforth*, 40 N. W. (2d) 389, it was shown that it was a custom or agreement among the truck drivers that the loaded gravel trucks be driven on the smooth portion of the highway and that the empty trucks be driven upon the rough portion of the highway, even though it involved driving on the wrong side of the highway.

One day the driver of a truck loaded with gravel and weighing approximately 16 tons was driving on the left side of the road because it was smooth. At that

time one Stephens, driving his empty truck, was proceeding toward the gravel pit to get another load of gravel. Each testified that he saw the other about a quarter of a mile away. When the trucks were approximately 150 ft. apart, each driver turned his truck to the west, and the trucks collided, while both drivers were driving on the smooth side of the road, but the loaded truck was on the left side of the road, as was customary.

In subsequent litigation the higher court held the owner of the loaded truck liable in damages to the owner of the empty truck, saying:

"There is no indication that an agreement between all of the truck operators or instructions of the contractor could supplant the statutory rules of the road upon a public highway entirely open for public travel."

Damages Allowed General Contractors

According to a recent higher court, where a sub-contractor submits a bid to perform construction work, a valid contract is made the instant the bid is accepted. Moreover, the sub-contractor who refuses to perform his contract, is liable in full damages to an owner or general contractor who accepted the bid. The amount of allowable damages equals the difference between the sub-contractor's bid and the amount the owner or general contractor paid another sub-contractor to perform the contract, plus all incidental costs, as interest on borrowed money.

For example, in *Westland Const. Company, Inc., v. Chris Berg, Inc.*, 215 Pac. (2d) 683, it was shown that a plastering contractor wrote to a general contractor, as follows: "Our bid for lathing and plastering the main floor of your plan No. 85 is, $505. An additional $35 is to be added if the recreation room ceiling is to be plastered."

The gentral contractor accepted the plastering contractor's bid and notified him when nine houses were ready for plastering. The plastering contractor refused to plaster the houses and notified the general contractor that due to increased costs, etc., the price for plastering each of the nine plan No. 85 houses would be raised from $505 to $868.

In subsequent litigation the higher court held the plastering contractor liable to the general contractor for damages, saying:

"Where a contractor refuses to perform his contract, damages may be recovered for the difference between the contractor's bid and the actual cost to the owner (general contractor) of having the work performed by others. Likewise, interest on money borrowed to finance a construction project, accruing while the work is held up by a delay occasioned by the refusal of the contractor to perform, is a proper element of damage."

Also, this higher court held that it is immaterial that the general contractor may not have made a profit on the whole venture.

Prevention of Enlargements

Considerable discussion has arisen from time to time over the legal question: If a company operates a business in a business district is a city zoning ordinance valid which prohibits continued operation of the business? The answer is no because prohibiting a person or company from continuing a regularly established business is "taking private property without just compensation" and violates the state and United States Constitutions. However, according to a recent higher court, a city ordinance *is* valid which prohibits a business owner from enlarging, extending, or altering its real property.

For example, in *Scerbo v. Board of Adjustment of Jersey City*, 67 Alt. (2d) 472, the testimony showed facts as follows: A city enacted an ordinance which prohibited erection of new plants and alterations of old plants in a specified area. A company which for many years had operated a plant in this area applied for a permit to alter its building for the purpose of installing additional machinery. The city board refused to issue the permit in view of the above ordinance, the higher court approving.

Also, see *Ever Company, Inc., v. Board of Appeals*, 86 N. E. (2d) 906. Here the testimony showed that one Ever had owned a plant in a city for many years when the city enacted an ordinance classifying this district.

The court held that since Ever had been located in the restricted area before the ordinance was passed the present business was not affected.

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It is this attention to possible improvement which is back of the continued high quality of CF&I grinding balls. For the past 18 years these balls have maintained a reputation for homogeneity, hardness, toughness, and wearability.

CF&I engineers are at your service on any grinding media problems. Let's talk it over.

The Colorado Fuel and Iron Corporation

Denver

PRODUCTS OF CF&I

CF&I GRINDING BALLS and RODS

K-P *Engineered*
WIRE SCREEN

* **SIEVING**
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Korb-Pettit Wire Screen is not only first quality in material and workmanship but is engineered for the job involved. Available in High Carbon Spring Steel and Oil Tempered Spring Steel for extreme abrasion resistance. Designed for all types of vibrators and rotary equipment. Request literature.

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"KEEPS PROMISES"

traffic news

CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 87942 (2)—Proposed to establish on crushed stone, crushed-stone screenings and slag (a product of iron and steel blast or open-hearth furnaces), carloads, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Chicago, Ill., and points taking same rates as shown in Central Territory Railroads Tariff 197-S, I.C.C. 4212 to Granger, Ind., 144 cents net ton.

Docket 87952 (1)—Proposed to establish on stone, rubble, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply, from Cincinnati, O., to Chicago, Ill., 277 cents net ton. This rate is subject to ExParte 162, 166 and 168 increases.

Docket 87964 (1)—Proposed to establish on refractory stone, unburned, crushed, in bulk, in open cars, minimum carload weight 90 percent of the marked capacity of car furnished, except that when car is loaded to full cubical or visible capacity, actual weight will apply, from Nashua, Pa., to Cincinnati, O., 362 cents per gross ton; Louisville, Ky., 410 cents gross ton.

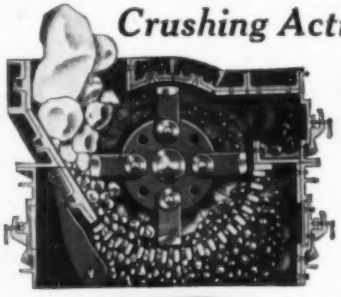
GENERAL FREIGHT TRAFFIC COMMITTEE—EASTERN RAILROADS

Bulletin G-2888 (Shipper)—Proposed to amend Central Territory Railroads Tariff 563-E, I.C.C. 4180 publishing commodity rates on lime, common, hydrated, quick or slaked, carload, applicable from origins in Central Territory to destinations in Southern Freight Association Territory, by providing for the addition of Toledo, O., as an origin point subject to the same rates as currently in effect from Genoa, O.

ILLINOIS FREIGHT ASSOCIATION

Application IRC 511-1009—Proposed to establish on limestone, agricultural, unburned, in bulk in open-top cars, minimum weight 90 percent of marked capacity of car, but not less than 60 tons, from Kankakee, Ill., and Lehigh, Ill., to Robinson, Ill. Present: $1.38 per net ton.

Get the CAPACITY and the* PRECISE *Crushing Action You Require with



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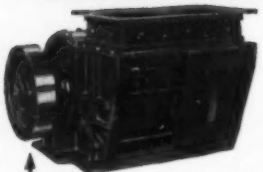
For efficient low-cost reduction of one-man size stone or screen rejects to *uniform* roadstone, aggregate or agstone sizes—Americans are built in three sizes . . . *with capacities up to* 250 *TPH.*

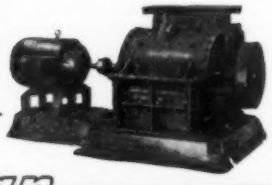
Center feed models in each size assure a higher ratio of fines by lengthening travel of stone in hammer cycle.

Conventional front feed models minimize fines.



American "30 Series" to 100 TPH

American "24 Series" to 50 TPH



Write for "Better Stone Crushing"

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1059 Macklind Ave.
St. Louis 10, Mo.

NYC tariff 1902. Proposed: $1.14 per net ton.

Above rate includes all increases.

Docket IRC 511-1114 (MRP 5537)—Sand, blast, core, engine, filter fire, furnace, loam, moulding, polishing, and silica, carloads, from Ottawa, Sheridan and Wedron, Ill., to Quincy, Ill. Present: basic, 178 cents per ton of 2000 lbs. Proposed: basic, 166 cents per ton of 2000 lbs.

Docket IRC 511-1115 (MRP 5536)—Proposed to establish on stone, ground or pulverized, crushed or rough quarried; also, strippings of stone quarries in straight or mixed carloads, from Krause, Ill., to East Alton and Alton Hospital, Ill. Present 95 cents per ton of 2000 lbs., subject to X-162 and 166 increases. Proposed: 80 cents per ton of 2000 lbs., subject to X-162 and 166 increases.

NORTH PACIFIC COAST FREIGHT BUREAU DOCKETS

(x) NC-1473 (S) (Amended)—Proposed to establish on lime, carloads, Evans, Wash., to Hanford and Richland, Wash., rate of 23 cents per hundredweight, minimum 40 tons in packages.

WEEKLY DOCKET AND STATUS REPORT OF PRIOR SOUTHERN FREIGHT ASSOCIATION PROPOSALS

Docket A-1016—Proposed to establish on crushed stone, carload, item 401-B, Southern Freight Tariff Bureau 388-G, Neverson to Farmville, N. C., 80 cents, not subject X-162-6-8.

Docket A-5171 (c)—Proposed to establish on stone, broken, open cars, 90 percent marked capacity, except that actual weight will govern where cars are loaded to full visible capacity, Balsam, N. C., to Plymouth Meeting, Pa., 506 cents net ton.

Docket A-5316—Proposed to establish on slag, carload, Siglo and Mt. Pleasant, Tenn., to Walworth, Wis., 343 cents net ton, 90 percent of marked car capacity. Not subject to X-162-66-68 increases.

PACIFIC SOUTHCOAST FREIGHT BUREAU PROPOSALS

Docket (X) 1341 (Shipper)—Proposed to establish on limerock, in closed cars, carload, from Dolomite, Utah, request for rates of $2.80 and $3.00 per ton of 2000 lbs., subject to X-168-A to Castle Gate and Sunnyside, Utah, respectively, minimum 80,000 lbs.

Docket 1357 (Shipper)—Proposed to establish on gypsum, carload, from Plaster City, Calif., to Seguro, Calif., rate of 18 cents per hundredweight in open cars and 19 cents per hundredweight in closed cars, minimum 40 tons.

Docket 1180—Lime Rock. Approved—from Arrolime and Henderson, Nev., to Compton, Calif., 16 cents in open cars, 18 cents in closed cars; to North Hollywood and Van Nuys, Calif., 17 cents in open cars, 19 cents in closed cars; to San Diego, Calif., 19 cents in open cars, 21 cents in closed cars, subject to minimum 40 tons. Declined to West Los Angeles and Inglewood, Calif.

Docket 1242—Lime rock. Approved 14

only a **1 MAN JOB** DIGGING with a

Sauerman Slackline Cableway

For 41 years the Sauerman Slackline Cableway has been the favored machine of the sand and gravel industry for wet pit excavation. It has no equal for low cost results in digging a large, deep pit and moving material in the same operation direct to top of plant or surge pile. The operator's job is easy and maintenance is simple. With occasional replacement of a few parts, a Sauerman machine will work at top capacity for many years and return its owner big profits.

STORY BEHIND THE PICTURE

The gravel plant of Louis Marsack & Sons, Mt. Clemens, Mich., offers a typical example of how the Sauerman Slackline Cableway enables its owner to build up a profitable business on a modest investment. The Marsack firm has for years been one of the leading suppliers to the Detroit market and all of its pit excavation has been handled by Sauerman cableways. The picture shows the present pit, 700 ft. wide by 60 ft. deep, and the 1 cu. yd. Sauerman machine.

Write for new Slackline Cableway catalog.

Rope Haulage Equipment Specialists Since 1909

SAUERMAN BROS., Inc.

534 S. Clinton Street — Chicago 7, Illinois

do 4 days' work in 3 with JAEGER pressure

125 ft. of 100 lb. air—Runs 2 heavy breakers or a heavy duty rock drill at full pressure.

15% to 20% more air @ 100 lbs. does 30% to 40% more work

It is important to you that, at full pressure, air tools hit enough harder and faster to do 30% to 40% more work than they do at the 70 lbs. pressure maintained by undersized compressors.

Jaeger "new standard" ratings (the first increase in the industry since 1932) give you the air you must have to run today's tools at proper pressure and efficiency—75 ft. of 100 lb. air instead of 60—125 ft. instead of 105—185 ft. instead of 160—250 ft. instead of 210—365 ft. instead of 315—600 ft. instead of 500. If this cost-saving interests you, send for Jaeger Catalog JC-8.

600 ft. of 100 lb. air — Runs 2 big wagon drills at full pressure, drilling 30% to 40% more footage than you can get with any 500 ft. compressor.

See your Jaeger distributor or write

THE JAEGER MACHINE CO.

602 Dublin Avenue — Columbus 16, Ohio

PUMPS • MIXERS • HOISTS • TOWERS
TRUCK MIXERS • PAVING MACHINERY

cents to Yuma and 26 cents to Phoenix, Ariz., minimum 30 tons.

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 54101 (1)—Proposed to establish on limestone. Falls Village, Conn., to Sweetwater, Tex., in carload lots, per ton of 2000 lbs., not subject to Tariffs X-162-B, X-166-C and X-168. From Falls Village, Conn., to Sweetwater, Tex., $11.79 per ton when in open-top cars and $12.28 per ton when in closed cars.

Docket 54241 (1)—Proposed to establish rate of 22 cents on gypsum calcined (an unfinished product having no commercial value for building purposes) in bulk or packages, carload, minimum weight 80,000 lbs. from Southard, Okla., to St. Louis, Mo.

FREIGHT TRAFFIC COMMITTEE TRUNK LINE TERRITORY RAILROADS

Docket TL-M-981 (Shipper)—Stone, natural (other than bituminous asphalt rock) crushed without coating of oil, tar and/or asphaltum, carload, minimum weight 90 percent of marked capacity of car, from Jamesville, N. Y., to Rome, N. Y., $1.39 per net ton, including all increases, in lieu of $1.83.

Docket TL M-998 (Shipper)—Proposed to establish on limestone, crude, fluxing, foundry and furnace, when loaded in bulk in open-top equipment, carload minimum weight 90 percent of marked capacity of car, from Annville, Meyerstown, Palmyra, and Swatara, Pa., to Philmont, Pa., 195 cents per 2,240 lbs., including all increases, in lieu of 226 cents.

WESTERN TRUNK LINE NEW APPLICATIONS

Docket X-E-41-1303—Proposed to establish on sand, gravel, and crushed stone, carload from Quartzite and Lincoln Center, Kan., to Hastings, Jeffers, Glenvil, and Level, Neb., rate of 230 cents net ton, not subject to X-162,166 or 168 increases.

Marquette Cement Mfg. Co. Awards New Plant Contract

The Marquette Cement Manufacturing Company has awarded the contract for its multi-million dollar cement plant at Brandon, Miss., to the M. T. Reed Construction Company of Jackson. Work has been started, with completion scheduled for September, 1951.

Building supplies and equipment will be purchased, wherever possible, from local sources, according to company officials.

Lake City Lightweight Aggregate Corporation, Lake City, Tenn., has completed and placed in operation its new plant at Briceville, Tenn. The aggregate, made from shale waste of a local coal, is marketed under the trade name of "La-Lite." The plant currently is on a three-shift seven-day-a-week basis. Two kilns expected to be in full operation soon.

New FARREL-BACON CRUSHER has many advantages

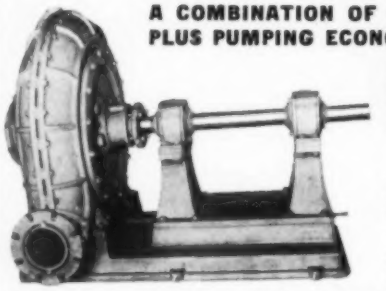
Design features of this 36 x 30 E stone crusher include: (1) Meehanite frame, sectionalized when necessary; (2) removable water cooled bearings; (3) improved design of swing jaw bearing; (4) force-feed oil lubrication, or circulating system if desired; (5) split flywheels; (6) flat or V-belt drive.

Write for further details or engineering help. BA-1

FARREL-BACON
ANSONIA, CONNECTICUT

AMERICA'S HIGHEST PRODUCTION PUMP
HAS A SHELL THAT WON'T WEAR OUT!

A COMBINATION OF PUMPING EFFICIENCY PLUS PUMPING ECONOMY PRODUCES



8" heavy duty, bottom discharge, "Tell-Tale" Centrifugal Sand and Gravel Pump, equipped with Ball Bearings and Patented Split Shell.

POSITIVE PROFITS FOR ALL "TELL-TALE" PUMP USERS.

The "Tell-Tale" Centrifugal Sand and Gravel Pump has a split Shell with equally-spaced Port Holes. Whenever the tough Shell Liner eventually wears thru, there is a tell-tale hiss as air is sucked into the Shell Liner. The Pump immediately loses its prime and stops pumping, thus preventing any wear on the shell.

The Wearing Parts of "Tell-Tale" Pumps are made of an alloy of semi-steel and nickel for toughness. Also available optionally in Ni-Hard for extra long wear.

Hundreds of satisfied users in 18 states and Canada. See your dealer, or write direct for Bulletin P, stating size Pump in which you are interested.

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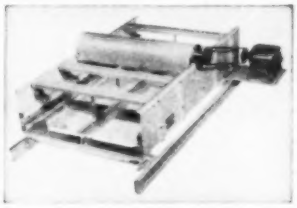
Lock Drawer 909 Est. 1892 Columbus, Georgia

HERE'S THE BIGGEST VALUE IN A VIBRATING SCREEN TO DATE!

The 1950 UNIVERSAL is the Screen for your finer and more difficult—separations.



- Powerful, 1800 rpm vibratory action.
- Two-point suspension assures uniform distribution of vibration.
- No binding on this resilient, vertical-action vibrating Screen.

YOU'LL PAY LESS FOR BETTER SCREENING!

Write today for Catalog No. 109 on Screens & Screening.

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RACINE, WISCONSIN

Be Multiwall Wise

Acclimatize

Keep Bags From Getting Thirsty

Multiwall Paper Shipping Sacks are amazingly tough. They don't need to be pampered. But they *do* need reasonable care. Unless they're protected against moisture loss, they dry out and can't work their best when being packed, closed, or handled. In some sections of the country "drying out" may happen in winter, in other sections during the summer, depending on the humidity. But it's a simple matter to keep Multiwalls from getting thirsty. Bemis Multiwall Specialists show you how.

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☐ Send information on Multiwall specifications.

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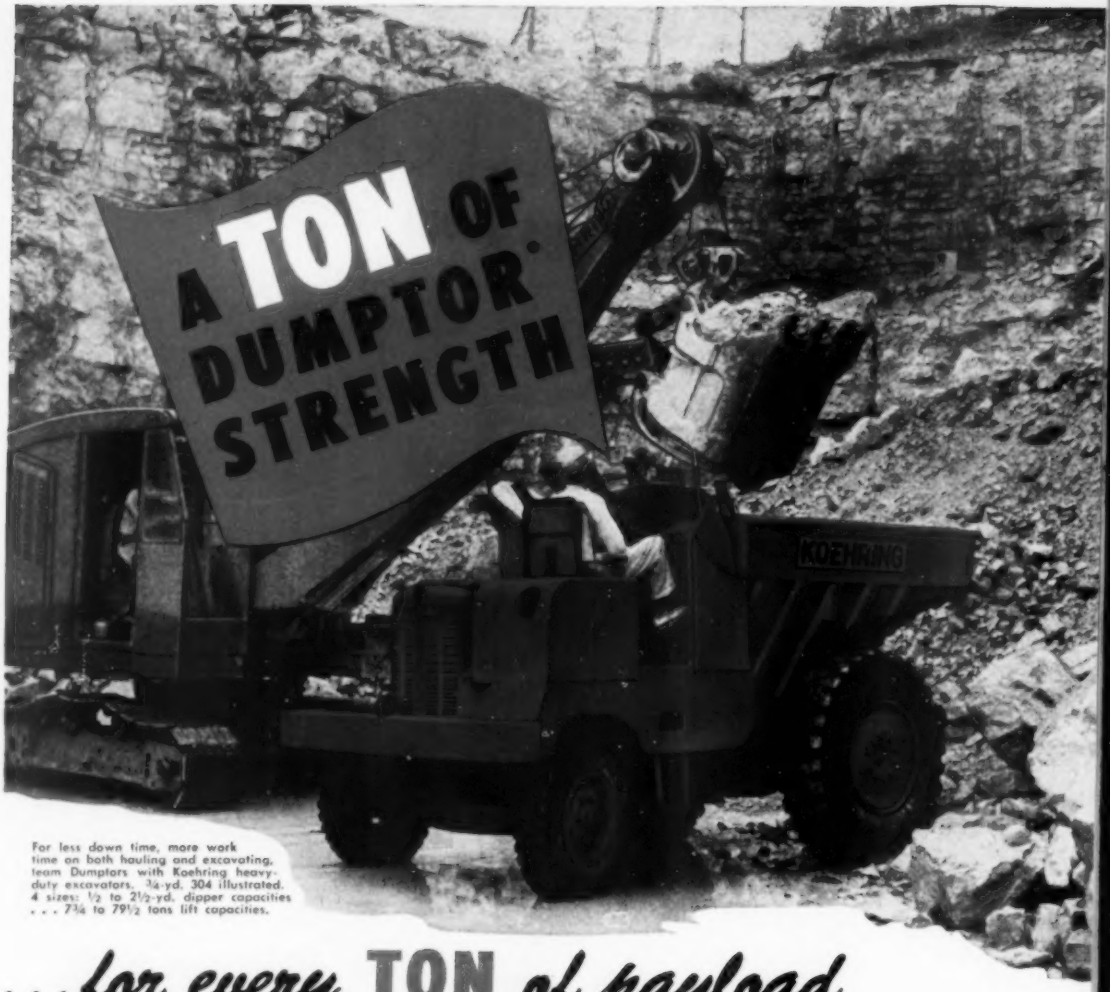

For less down time, more work time on both hauling and excavating, team Dumptors with Koehring heavy-duty excavators. ¾-yd. 304 illustrated. 4 sizes: ½ to 2½-yd. dipper capacities . . . 7¾ to 79½ tons lift capacities.

. . . for every TON of payload

Dumptors stand up under the severest shocks of shovel-loading 1½ to 2½ yards of rock at a pass because they're built extra tough for rock handling. There's more than a ton of net vehicle weight for every ton of payload.

All-welded body, sides, ends and bottom are heavily reinforced with 4" channel ribs. More than triple strength has been built into the bottom . . . seasoned 1⅝" oak timbers are securely bolted between two layers of 5/16" steel plate. Steel-oak-steel construction cushions shocks of rock loading. Free-swinging, kick-out pan adds another tough 3/16" high-manganese steel plate for extra protection. Dumptor also has: rugged main frame, 8" ship-channels, heavily trussed . . . one-piece steel drive-axle housing and transmission case . . . 4" chrome steel drive axles . . . cast alloy steel "I" beam steering axle. All add extra strength to Dumptor chassis.

Heavy-duty construction like this assures you that Koehring 6-yard Dumptors will stand up under your toughest assignments . . . that there will be little down time with Dumptors on your job. For complete facts, see your Koehring distributor today.

CK122

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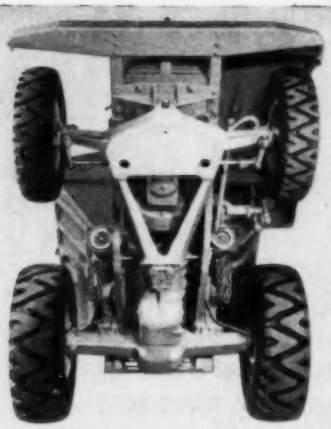
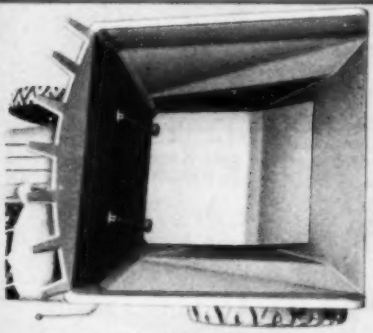
KOEHRING DUMPTOR

KOEHRING COMPANY, MILWAUKEE 16, WIS. • SUBSIDIARIES: • KWIK-MIX • PARSONS • JOHNSON



NO "SOFT SPOT" on Dumptor's underside . . . 1-piece, cast steel housing protects drive axle and enclosed chain drive. Wishbone supports the skid plate . . . shields the radius rod and the engine crank case . . . and supports the oscillating steering axle.



KICK-OUT PAN adds an extra 3/16" high-manganese steel plate on top of sturdy Dumptor bottom . . . breaks suction of sticky materials for fast, clean dump. Big 8' x 8' top gives easy-to-hit target for fast loading over the side or end . . . with less spillage.

1-SECOND GRAVITY DUMP . . . no slow-acting body hoists . . . no body-hoist maintenance . . . plus same speeds forward and reverse for ... ture shuttle hauling keep production yardage high, costs low with Dumptors.

Johnson

EXTRA TONNAGE at NO EXTRA COST

FASTER OPERATION

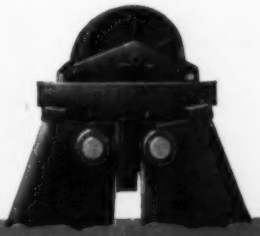
Large diameter sheaves, with fully sealed needle bearings, reduce friction power loss, deliver full power to cutting lips to provide faster, smoother operation.

BIGGER LOADS

Because all-welded construction improves bucket balance and lowers center of gravity, Johnson bucket teeth dig in straight and deep. Deep, big bites get capacity load every time, in any material.

LONGER LIFE

Stronger and longer-lived because all-welded construction, by saving weight on other parts, permits use of heavier lips, heavier sides, heavier bottoms. Open lower sheave frame keeps sheave spaces clean; material cannot collect under sheaves. Hard manganese cutting edge, welded to heavy lips, actually gets tougher with use.



⅛ to 2½ yard sizes. General Purpose, Wide Rehandling and Heavy-duty Digging Type.

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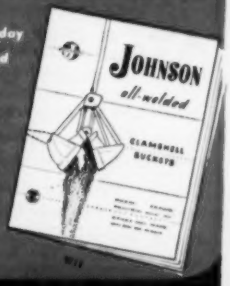

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for efficiently handling sand, gravel, etc.

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Mountains of material for construction highway projects are being moved every day by dependable ATLAS Machines.

Combining soundness of design with careful craftsmanship in construction, ATLAS units insure

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ATLAS Service covers the continent. Our Distributors are immediately available for consultation if you have any troublesome problems in loading or conveying.

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The ATLAS Line includes Bucket Elevators, Boxcar Loaders, Car Unloaders, Portable Elevators, Truck Loaders, Portable Belt Conveyors, and similar equipment.

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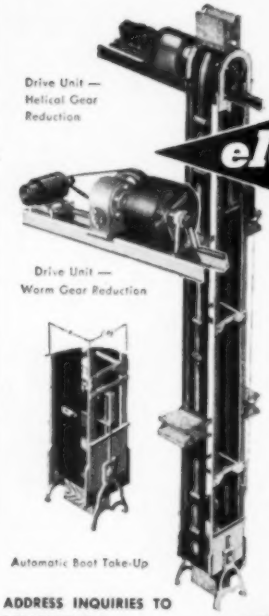

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By speeding up inter-floor communication. *No waiting* — another step passes in a few seconds.

Takes up little space. Installation costs are moderate.

Handy *manual control rope* and an *automatic safety stop* guarantee safe operation.

The EHRSAM employees elevator is made in three belt widths, 12, 14, and 16 inches, and with 3 and 5 H.P. drive units. Special designs available for handling bags and boxes. Write today for more complete information.

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December 1950

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ASSURED BY

MAXIMUM EFFICIENCY
MINIMUM MAINTENANCE
TROUBLE-FREE SERVICE
STANDARDIZED PARTS
PLANTS THAT CLICK
YOUR MONEY'S WORTH

TOP GRADE MATERIALS
RUGGED SIMPLICITY
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EXPERT ENGINEERING
DESIRE TO SERVE

THE FAMOUS STEARNS BATCH MIXERS

"Don't get a boy to do a man's work" is good advice when you are buying a new mixer. You want a sturdy efficient mixer to operate steadily under a full load with low maintenance and power costs. Stearns Batch Mixers will meet your requirements and *do a better and faster job of mixing.*

Five standard Mixer sizes: 12, 18, 28, 42 and 50 cu. ft. • Pulley or V-Belt motor • Mixing blades in Ni-Hard metal • Self-aligning, anti-friction, dust-proof bearings • Steel drums welded to heavy heads • Easy-open, lock-tight, no-leak door • No charge for consultations with Stearns Engineers, who *don't have to guess!* • Prompt delivery • Literature.

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BACKED BY MORE THAN A
QUARTER-CENTURY OF KNOW-HOW

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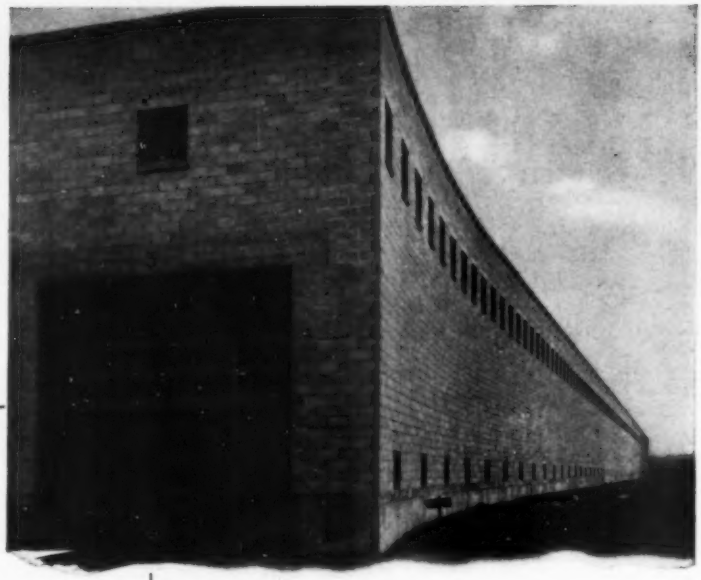
U. S. Army Post Office, Long Island City, N. Y. Built under supervision of Col. Edgar W. Garbisch, USA, Dist. Engr. Architect—Engineers—Alfred Hopkins and Associates—Contractors—John A. Johnson Contracting Corp., Brooklyn, N. Y. Concrete Block by National Brick Corp., L. I. City, N. Y.



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Duraplastic portland cement's air-entraining feature permits use of a damper mix for machine-made products. This damper mix is "rubbery" and cohesive. It stays together better and feeds easily through machines. Manufacturers find Duraplastic ideal for concrete block, brick, drain tile, silo staves and many other machine-made products.

Makes superior concrete products

Plants using Duraplastic report increased resistance to passage of water in finished products. Costly breakage is reduced because green products made with Duraplastic can take rougher handling and there are fewer culls and throwbacks. Face texture is richer, especially when harsh aggregates are used. Edges and corners are truer.

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NEWS OF CONCRETE MANUFACTURERS

S. E. Concrete Pipe Assn. Meets at Charlotte, N. C., Elects 1950-51 Officers

About 120 members of the concrete pipe industry attended the meeting of the Southeastern Concrete Pipe Association on October 23 and 24 at Charlotte, N. C. Charles Proudley, testing engineer for the state of North Carolina, was the guest speaker. Members also heard a review of the industry's standing, and discussed technical problems.

Chosen as the new officers of the association were Henry Strohecker, president; Thomas Arp, vice-president; Vernon Kyle, secretary; and L. D. Weaver, treasurer.

"Save Lives at Any Cost"— Urges Head of R.M.C. Plant

In an all-out effort to promote safety measures in his firm, Frank P. Spratlen, Jr., president of the Ready Mixed Concrete Company at Denver, Colo., recently wrote a letter to all of the company's truck drivers, stressing the necessity of saving lives at any cost.

Mr. Spratlen stated that a crash in October, involving a company truck, in which one person was fatally injured, was the first fatal accident in his business experience, and that so far as he could ascertain, the firm was not at fault. Spurred by this tragedy, however, Mr. Spratlen thus instructed his drivers:

"Although saving time on deliveries is very important to us, saving a life is even more important . . . Yield the right of way whenever necessary; if a car wants to pass you, pull over toward the curb and let it go by; if a driver is speeding toward the intersection, slow down and let him go through. Even when you have the right of way, it is the mark of an expert driver to give up that right of way if an accident can thereby possibly be avoided."

Mr. Spratlen further ordered his drivers to refuse to take trucks out if the brakes of their vehicles are not in working order.

Three Firms Merge to Form Superlite-Materials Corp.

Formed by a merger of the Pumex Company and the Builders' Supply Company of Phoenix, Ariz., and the Super-Lite Company of Calpatria, Calif., a concern known as the Super-Lite Material Corporation of Albuquerque, N. M., has been established in Albuquerque for the mining of pumice and volcanic ash and the manufacture of products from these materials. Capacity is 40,000 units per day on a 24-hour schedule.

An announcement released by the officers of the new firm when it was formed last August stated that the company would maintain plants in Phoenix and Calpatria, and that new facilities would be operated at Albuquerque. Heading the new corporation are the following: Roy Cook, president; David F. Wallace, treasurer; and Gilbert Olson, formerly with the Super-Lite Company in Calpatria, secretary.

Mr. Cook stated recently that the Albuquerque plant is now operating at or near capacity, and that pumice is secured from lands leased on the Santa Clara Indian reservation near Santa Fe.

Minnesota Firm Building Modern $250,000 Block Plant

Currently under construction at South St. Paul, Minn., is a $250,000 concrete block plant scheduled to be opened by the Standard Building Materials Company about May 1, 1951. The new facilities will form a part of the firm's expansion program.

Standard also recently completed a new ready-mixed concrete plant with a capacity of 100 cu. yds. daily. Joseph Chalupa is president of the concern.

The National Concrete Products Assn. (Canada) will hold its second annual convention at the Royal Connaught Hotel, Hamilton, Ont., on January 29 and 30, 1951. A machinery show will be staged in connection with the meeting.

Coming Events

January 22-25, 1951 — Cleveland. 31st annual meeting and exhibit, National Concrete Masonry Association. Cleveland Auditorium.

February 12-15, 1951 — New Orleans. 21st annual convention, National Ready Mixed Concrete Association. Roosevelt Hotel.

February 20-22, 1951 — San Francisco. 47th annual convention, American Concrete Institute. St. Francis Hotel.

March 1-3, 1951—New York. 43rd annual convention, American Concrete Pipe Association. Waldorf-Astoria Hotel.

Hovey Doubles Output Of Pumice Block At New Santa Fe Plant

Production of pumice building blocks in Santa Fe, N. M., was doubled with the opening of a plant there by the Hovey Concrete Products Company, which is turning out between 4,500 and 5,000 blocks daily.

William B. Hovey, operator of the new plant, is a graduate engineer from the University of Wisconsin with a background of years of experience in South America. M. R. Adler, also a graduate engineer, is sales manager and in charge of the testing laboratory used for maintaining control of the materials and manufacturing process.

Other pumice block manufacturers in Santa Fe are the Western Empire Builders and Pumice Products Company, which have been established there for some time.

H.H.F.A. Issues Pamphlet On Concrete Masonry Walls

Concrete Masonry, a pamphlet issued by the Housing and Home Finance Agency, cites five advantages of concrete masonry in wall construction, economy, fire resistance, suitability for both load-bearing and non-load-bearing walls and partitions, use as backups in walls of other facing materials, and adaptability to various styles of architecture, including a wide variety of surface finish for both exterior and interior walls.

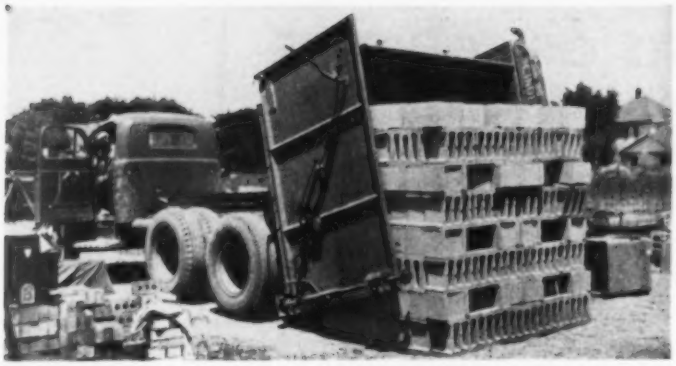
The booklet covers materials, standards, manufacturing processes, curing procedures, and good practice recommendations for building dwelling walls. It is available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 15 cents per copy.

200-Yd.-per-Day R.M.C. Plant Added by Grayson Lumber Co.

Recently put in production at the Grayson Lumber Company's plant at Birmingham, Ala., is a Blaw-Knox ready-mixed concrete plant of the latest type, capable of turning out 200 cu. yds. per day.

Supplementing the ready-mix plant is a fleet of new transit-mix high-dumping trucks, as well as a system for dispatching orders with utmost efficiency. A popular feature of the ready-mix service is an arrangement by which orders can be turned out and delivered on Saturday.

George L. Ross, president of the Ready Mixed Concrete Company of Kansas City, Kan., died on September 24 after an extended illness.



• An interesting development in methods of handling concrete blocks is this automatic block carrier, two of which are now being used by the Cinder Block & Material Company of Indianapolis, Ind. Operated by one man, the "Blockster" loads and unloads 400 8-in. blocks or equivalents. The cubed blocks are picked up by hydraulic pressure from the sides and by the bed of the truck. The "Blockster" is manufactured by the Fontaine Truck Equipment Company, Birmingham, Ala.

Bradley University to Have $5,000 Testing Equipment

An important engineering facility will be added to the Peoria, Ill., area, and Bradley University's college of engineering curriculum will be considerably expanded with the installation of a $5,000 concrete testing machine.

In announcing that the machine has been ordered, Dean Russell E. Gibbs stated that the device would furnish local members of the construction industry with the first service of the kind in this area.

It was revealed that the testing machine has a crushing force of 300,000 lbs. Specimens 8 by 16 in. and concrete units measuring up to 12 by 18 in. can be tested in the device. Dean Gibbs also pointed out that the addition of the testing equipment would permit expansion of the school's civil engineering courses.

Copeland, French Participate In Stockpile Drying Tests

In tests currently being conducted at the Cleveland Builders Supply Company's plant, N.C.M.A.'s director of engineering, R. E. Copeland, and Jack French, assistant engineer, ran tests on the rate of drying of concrete block stored in stockpiles, under cover.

Working with eight stockpiles of 8- and 4-in. lightweight concrete units, the experts studied the effect of the amount of natural ventilation through the stockpile, and other factors on the rate of drying.

Similar studies will be conducted at plants of other N.C.M.A. members in other areas to determine the effect on drying rate of such variables as type of aggregate and climatic conditions.

The sale of the ready-mixed concrete business of C. W. Cork at Redmond, Ore., to Thomas J. Stearns of Bend, Ore., was announced recently. Mr. Stearns has been associated with a Bend ready-mix concern for the last four years.

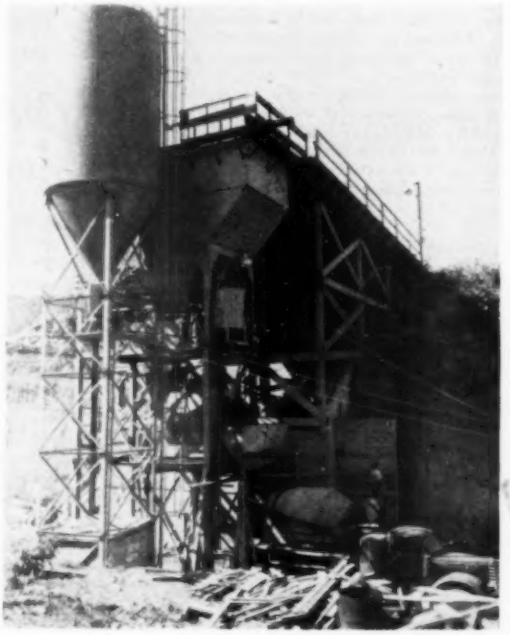
Lewiston Pre-Mix Concrete Helps to Fill Local Demand

The twin cities of Lewiston, Idaho, and Clarkston, Wash., gained adequate capacity to supply their construction needs of ready-mixed concrete early in 1950, when the new and modern plant of the Lewiston Pre-Mix Concrete Company, went into operation.

The company is affiliated with American Transit Mix, of Clarkston, which has been operating a batching plant on the Washington side of the Snake River for several years.

The Lewiston plant was built and erected by the Noble Company, Oakland, Calif., and a hillside ramp makes it possible to load the 4-compartment aggregates bin and elevated 500-bbl. cement silo by gravity, eliminating the need for elevators or conveyors. All concrete is shrink-mixed by a Koehring 56S mixer. The truck-mixer fleet consists of nine Jaeger units of various capacities.

With both plants in operation, the length of haul has been reduced considerably, and construction jobs on either side of the river are now being serviced much more rapidly. Both plants are owned by Stanley Lafrenz. Oscar Elsensohn is manager of the new Lewiston installation. The concern has its own river sand-and-gravel plant which supplies it with sufficient aggregates to make it practically independent of outside purchases of sand or gravel.



The Lewiston Pre-Mix Concrete Company, Lewiston, Idaho, built this new central-mix plant early in 1950. The overhead ramp allows gravity loading of aggregate and cement bins.

Concrete Pipe Men Hear W. M. Caldwell At San Jose Meeting

San Jose, Calif., was the scene of the fall meeting of the Western Concrete Pipe Association, held at the Hotel de Anza on October 6 and 7. More than 100 members attended to participate in discussions and to hear an address delivered by W. M. Caldwell, president of the California Association of Employers.

Recommendations were forwarded through Howard F. Peckworth, managing director, to Committee C-13, A.S.T.M., regarding the findings of the Technical Problems Committee and the preparation of specifications for extra strength of non-reinforced concrete pipe through 24 in. in diameter.

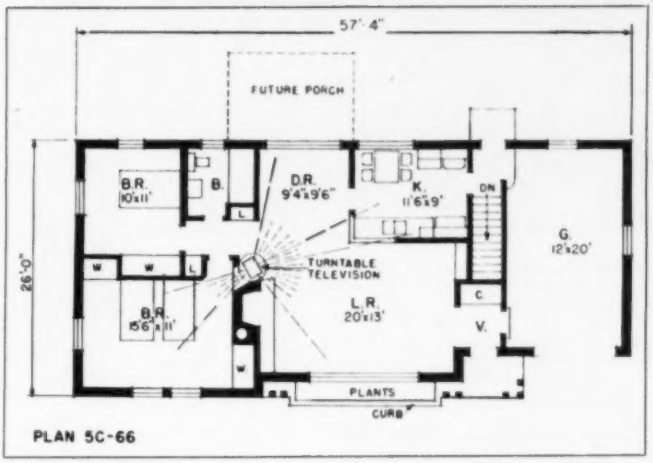
George Lang, founder and manager of the Cunard-Lang Concrete Company of Columbus, O., died of a heart ailment on October 9 in a local hospital. He was 69 years of age. Mr. Lang, a pioneer in the concrete block industry, retired from active business in 1946.

Famed Television Home Features Clever Use of Concrete Masonry

ONE of the most popular attractions at the Chicago Fair of 1950 was the Avenue of Homes, which featured the concrete masonry Television Home sponsored by nine local members of the National Concrete Masonry Association in conjunction with the Portland Cement Association.

As indicated by its name, the home, designed by Elmer Gylleck of Elgin, Ill., was so planned that its television set could be viewed from the living room, the dinette, the kitchen, and one of the bedrooms. (In the case of the kitchen and bedroom, the screen is seen through a glass partition.)

A portion of the exterior wall around the large front window was laid up in a random ashlar pattern, while the remaining walls employed units in a running bond pattern with the horizontal joints tooled and the vertical joints left flush to give the house a clapboard effect. The interior of the living room combined plastered walls and stacked concrete masonry. Both bedrooms displayed exposed concrete block in random ashlar patterns.



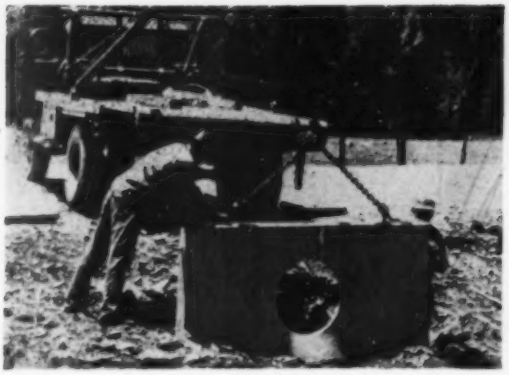
• Floor plan of the Television Home at Chicago's Fair of 1950.

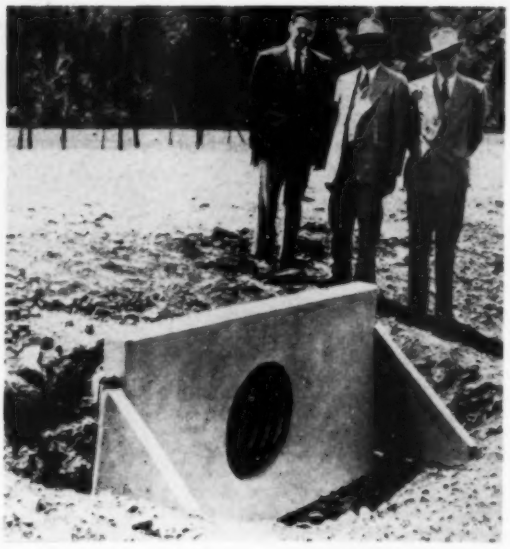
Firms cooperating in the venture are the following: Arlington Concrete Products Co., Inc., Arlington Heights, Ill.; Chicago Block Co., Inc., 1514 W. Van Buren Street, Chicago; Elmhurst-Chicago Stone Co., Elmhurst, Ill.; E. L. Ramm Co., LaGrange, Ill.; Illinois Brick Co., 228 N. LaSalle Street, Chicago; Independent Concrete Pipe Corp., Lockport, Ill.; Mid-West Concrete Pipe Co., 228 N. LaSalle Street, Chicago; Pre-Cast Concrete Products, Inc., 400 W. 107th Street, Chicago; and The Oswalt Co., Forest Park, Ill.

• Exterior of the concrete masonry Television Home, viewed by more than 400,000 persons who visited the Chicago fair.

• A view of the Television Home (front exposure) during construction.

• A corner of the living room, showing the dinette area (left). Note the use of exposed concrete masonry units laid up with continuous horizontal and vertical joints. The glass partition makes it possible for the housewife to view television programs while attending to her duties in the kitchen.





• Precast headwall being lowered for attachment to the culvert pipe near Berthoud Pass, Colo. The installation was completed in 7 minutes by two men.

• Right: Standing beside the completed installation are Lucas Wilson (center), executive officer of Protex Industries, flanked by his sons, C. Stanley and Donald J. Wilson.

Time, Material, Costs Cut In Headwalls Utilizing Air-Entrained Concrete

A new discovery in the precasting of concrete has recently been made in the commercial production of a patented pre-cast headwall. The new "Protex" headwall may effect large savings for contractors, government departments, and the general public because of the quality of concrete which is used, and the saving in construction time, engineering time, material, and labor costs. This product has been recently put on the market by Protex Industries of Denver, Colo., manufacturers of Protex air entraining agent for concrete.

In a recent test a Protex precast headwall was set on a highway high in the Rocky Mountains on Berthoud Pass by two men. The job was completed in seven minutes. (See illustrations.)

It had been discovered that by using Class A Protex air-entrained concrete instead of the usual Class B concrete used in headwalls, weight was reduced almost half in headwalls of all sizes. Obviously, better concrete is the result, and the public saves money and gets a better job. Complete protection is given against freezing, since each headwall is cured properly against low temperatures.

The new Protex pre-cast headwall is designed and engineered so that, regardless of angle or skew of the corrugated metal or concrete pipe, it fits perfectly, as though cast on the job. This unique feature of the new headwall, making it possible to accommodate the pipe regardless of the direction it takes in coming into the headwall, is one of these special patented features.

The pipe is first set to the headwall. The engineer then provides the degree or angle of cut, after which the pipe is cut to fit perfectly. Special patented lug bolts are used to hold the pipe in place during the grouting process. Grouting is simply handled in a few minutes with the use of the special grouting board.

The concrete is reinforced with a ring of steel and rods and wire mesh, in addition to the use of Protex air entraining agent. Not only is it light in weight, but much more durable than ordinary headwalls.

The price on these new pre-cast Protex headwalls has been standarized. All headwalls necessary for the project can be loaded on one truck and distributed along the road with the crane. They can be installed with or without foundation base, with one wing wall, two wing walls or without any wing walls.

Full information about the new Protex pre-cast headwall and information regarding franchise rights and franchises for manufacturing rights may be secured by writing the Protex Industries, 1331 West Evans, P. O. Box 4044, South Denver Station, Denver, Colo.

Georgia Producer Operating Products Plant at DeKalb

One of the newer industries of DeKalb, Ga., is the DeKalb Concrete Products Company, recently opened by H. E. Shaw.

Equipped with a Stearns mixer and a Clipper Stripper block machine, the plant turns out concrete masonry units made of granite furnished by the Consolidated Quarries Corporation of Decatur, Ga. Mr. Shaw has been associated with the ready-mixed concrete, crushed stone, and concrete masonry industries for the last 14 years, but only recently opened his own plant.

University of Kansas Offers Courses in Concrete Usage

At the University of Kansas extension center in Kansas City, Mo., courses are currently being taught in building construction techniques, covering the use and application of concrete, reinforced concrete, and structural steel design.

The practical course in concrete consists of 8 sessions under the direction of E. J. Mueller of the Portland Cement Association. Henry A. Crandall of the Kansas City Public Works Department is the instructor of the course in reinforced concrete and structural steel design, which has 16 sessions.

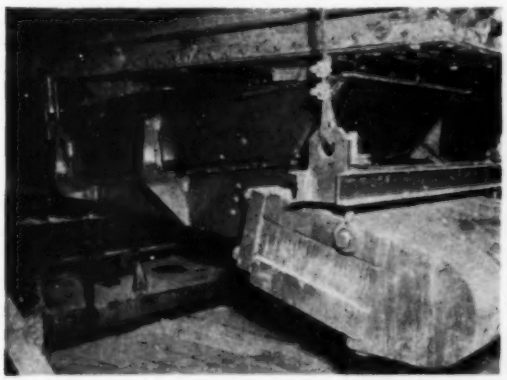
Bloomington, Ill., has a new industry, the ready-mixed concrete plant opened recently by the Bloomington Builders Supply Company. Equipment includes a 1,000-bbl. silo for cement storage, a 250-ft. conveyor, and a pushbutton-controlled mixer.

• The accompanying illustration shows the new offices and assembly plant of the Columbia Machine Works, 107 S. Grand Avenue, Vancouver, Wash. The home office of the firm is also located in this building, which was erected to accommodate expanding business.

New Ready-Mix Plant at Pittsburgh Is One of the Finest in the Industry

By WILLIAM M. AVERY

ONE of the outstanding new ready-mixed-concrete plants constructed and placed in operation in 1950 is the exceptionally well-planned multiple truck-loading plant of the Iron City Sand & Gravel Corporation at Pittsburgh, Pa. Placed in operation last June, the installation is believed to be one of the largest single-location setups in the country. Although there are probably equally large plants from the standpoint of hourly output, we believe this is the first plant in the country to provide facilities for batching into four mixer trucks simultaneously. There are also separate and additional weigh batchers for sand and bulk cement, as well as a conveyor belt and batcher arrangement for weighing out special cements stored in bags. With this tremendously versatile setup it is possible to meet promptly a wide range of specification requirements, and to accommodate almost any type of customer.

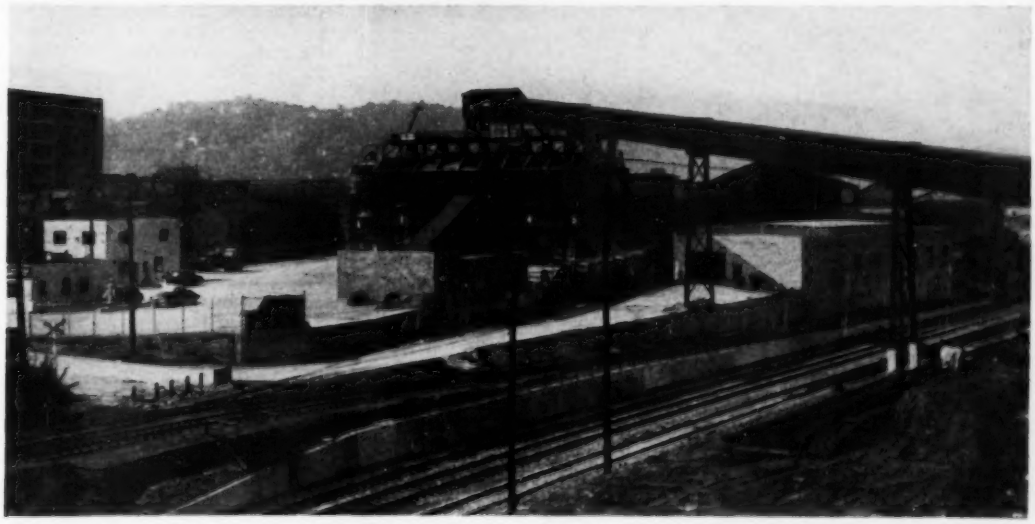


• Left: One of the five vibrating feeders which feed sand and gravel from the lower yard bins into the conveyor system which supplies the batching bins at Iron City Sand and Gravel Corporation's ready-mix plant.

The new plant, which replaces older and badly congested facilities at approximately the same site, is located on the south bank of the Monongahela River, on the south side of Pittsburgh. The older setup, which was operated in conjunction with the company's aggregate yards, had several inherent shortcomings, from the standpoint of location. Since it was right on the river bank, all trucks coming and going had to cross the adjacent railroad yards—a necessity that was at least as hazardous as it was time consuming. Service was also subject to interruption during periods of high water. And finally, there was the matter of congestion.

A new industrial site, comprising almost two acres of land, was purchased on higher ground immediately south of the railroad yards and approximately 500 ft. from the river front property. Aggregates are fed from bins located on the river bank directly into the storage bins of the new batching plant by a system of belt conveyors which crosses the intervening railroad yards. To simplify identification, in the discussion that follows, the river bank area will be referred to as the lower yard, and the site of the new plant as the upper yard.

In addition to the supply bins for the new batching plant, the lower yard contains a well equipped crusher house, two stiff-leg derricks for unloading barges, a machine shop and boiler house, and a 24-car siding for loading sand and gravel. Iron City has carried on sand and gravel operations at this location for almost 75 years, using



• A general view of the Iron City Sand & Gravel Corporation's new ready-mixed concrete plant at Pittsburgh. The enclosed belt conveyor from the lower yards comes in at the right.

• A closeup of the multiple-station batching plant. The bin at the left holds 800 bbls. (about two carloads) of portland cement. Note the pipeline through which the cement is pumped to the bins.

• A view of the reversible shuttle belt by means of which aggregates are directed into the proper bins.

• Left: The controls for the feeders and conveyors, as well as for the cement pumping system, are operated from the head house above the bins.

its own fleet of barges to haul the material in from various dredging locations along the river. At the present time most of the material is dredged near East Liverpool, O., a 24-hour round trip for six barges under tow by one of the company's three towboats. The barges, of which the company has some 50 in all, hold approximately 500 tons each.

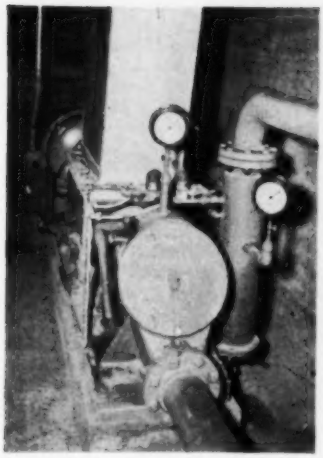
At this location there are three bins with a total capacity of 400 tons, and a fourth four-compartment bin with a total capacity of 250 tons. Normally these are charged directly from the barges with a stiff-leg derrick mounting a 3-cu. yd. bucket. Additional material can be stockpiled on the ground between the hoist and the bins and reclaimed when needed.

The short 30-in. belt conveyor which is located under the bins in the lower yard is fed by five Syntron Type F-55 Vibra-Flow feeders. These feeders, as well as the three belt conveyors which comprise the aggregate handling system, are controlled from a platform above the batching bins, the electrical system being fully interlocked so that there is no possibility of flooding anywhere in the circuit.

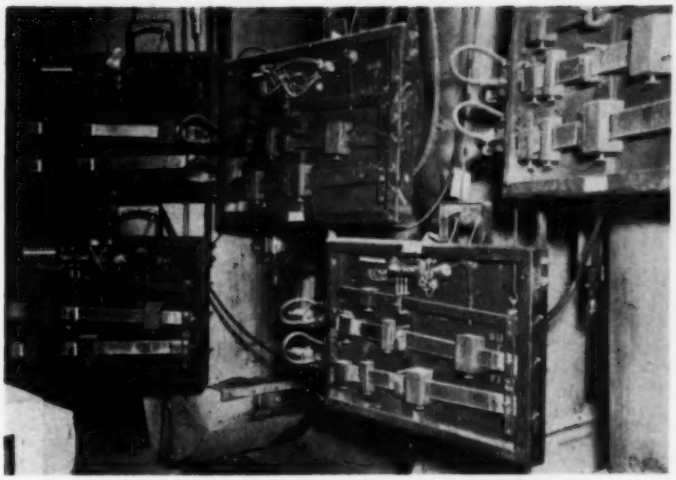
The feeder belt discharges onto a 30-in. by 500-ft. long inclined belt conveyor which terminates in a head house mounted above the batching bins. This 400-t.p.h. conveyor is fully enclosed, and it is flanked throughout its length by a catwalk, so that employees can move between the upper and lower yards without having to cross the railroad tracks at grade level. The intermediate supports consist of four steel A frames which rest on concrete piers. This unit, as well as the two other conveyors in the handling circuit, is equipped with Link Belt pulleys and idlers, and has Goodrich belting.

At the top of the batching plant, and midway between the extreme ends of the structure, the long conveyor discharges the material onto a 30-in. shuttle conveyor. This unit is reversible, and has an electric drive which enables the operator to position it quickly for feeding any compartment of any bin in the system.

There are five steel bins in the main structure with a total capacity of 1250 tons. The first of these (No. 1 in the illustration) is used for sand only, and is divided into just two compartments; each of the remaining four bins is partitioned into four compartments for aggregates, and in addition has a 200-bbl. waterproof cement compartment down the cen-



• The pump and the rotary compressor for the cement pumping system are housed in an underground concrete room next to the rail siding. The pumping system has a rated capacity of 500 c.f.m.



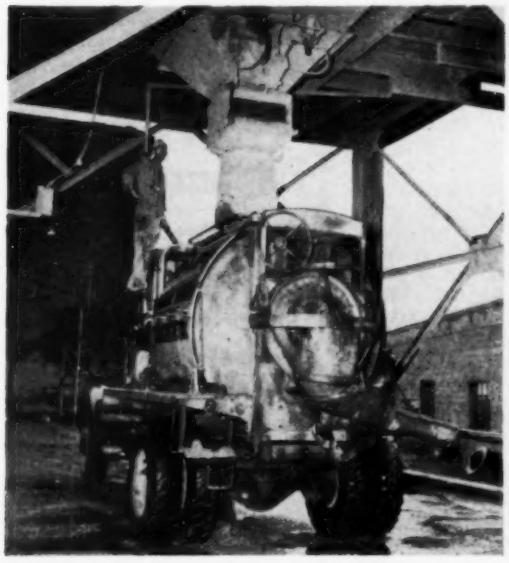
• A view of the scale beams for one of the fully-automatic batching stations. Double beams permit alternating from one set of proportions to another by merely pressing a button.

ter. Except or the cement compartment sections, all live bins are open at the top; the various aggregate compartments are fed from the shuttle conveyor by means of pant-leg chutes, equipped with flop plates which direct the flow to either side of the centerline.

The storage and handling system for cement at this plant is one of its outstanding features. Bulk cement may be received by rail, or truck, entering first a conventional undertrack hopper and screw conveyor. The screw conveyor delivers cement to a Type L-6 Fuller-Kinyon pump, operating in conjunction with a Type C-100 rotary compressor of the same make. These units pump the cement through a 5-in. pipeline at some 500 c.f.m.

The main storage point for bulk cement is an 800-bbl. Heltzel bin (unit A in the photograph), which is located just beyond the aggregate bins and is on the same centerline. This bin is divided into two compartments, each of which can hold roughly a carload of cement; this space is normally used for storing state cement, and there is a Blaw Knox batcher below the bins to assure the same accurate weighing of cement at this point that is maintained at the other batching stations in the plant. The 5-in. diameter pipe line for cement has six points of discharge in all; one at each of the four 200-bbl. cement compartments located in the aggregate bins, and two at the 800-bbl. Heltzel bin. The valves for these various points of discharge are operated from the walkway above the bins. Automatic bin controls sound an alarm and shut off the pump whenever the bin into which it is discharging fills up. The operator at the top of the plant can start or stop the pumping system from the same panel board which controls the handling system for aggregates.

For types of cement not used in sufficient amounts to justify bulk storage, there is a special building for storing bagged materials. This setup includes the unique provision



• Left: One of the company-owned trucks being loaded. The driver fills the water tank on the truck from the tank on the batching floor.

• Below: The operators at the control console for the fully-automatic batchers.

• Hosing down one of the truck mixers at the end of the day. The material washed from the drum is collected in the shallow settling tank at the right.

of an inclined belt conveyor and a weigh hopper which make it possible to batch out bagged cement by breaking the bags over the conveyor. The equivalent of a carload of cement can be stored and handled at this point.

Each of the four main batching stations has its own water tank, so that truck mixers can be charged completely at each of the four locations. Two of these stations have fully-automatic Johnson batchers, each equipped with two selective scales, so that either of two mixes can be batched out by pressing the proper control button. The other two stations have manual batchers for aggregates and automatic cement scales. Under normal operating conditions one man looks after the fully-automatic batchers, and another runs the two manual batchers. All the cement compartments in the plant have aeration nozzles to assure an even flow of material. Two automatically controlled compressors (one for stand-by) supply air to the nozzles and to the cylinders which operate the bin gates.

All the aggregate storage bins in the plant have provision for heating during cold weather operations. Steam for this purpose is produced with two 150-hp. gas-fired, fully-automatic steam generators located in the lower yard. The steam lines are located in the enclosure over the main conveyor, which feeds aggregates to the batching plant. Provision has also been made for heating water.

At present Iron City regularly operates 21 truck mixers, and under most normal conditions as many more trucks are hired from Conserco rental service. The company-owned units are mostly of 3-cu. yd. capacity, but there are two 4-cu. yd. machines in the fleet. Rex, Blaw-Knox and Jaeger mixers predominate, and most of the units are mounted on International and White trucks.

Among the auxiliary facilities on the property is an excellently equipped 75- by 160-ft. garage in which all company-owned trucks are parked at night. A special night crew takes care of cleaning, greasing, gasing, and most types of repair work on the trucks. By using aisle space for parking, 30 trucks can be accommodated. There is a separate storage room inside the garage for oil, tires, and general supplies.

The cleaning of the mixers is handled in an interesting way. Just outside the garage there is a shallow, curved-bottom concrete pit, toward which all of the adjacent paved area drains. When the trucks are hosed down, and the mixer drums flushed out at the end of the day, all waste material drains into the pit and settles to the bottom. The pit is scooped out once a day with a Lull tractor-loader unit, which loads the material into a dump truck for disposal.

To assure the smooth functioning of the widely scattered units which make up this plant, the company installed a complete Teletalk communication system covering 13 stations in the upper and lower yards. For example, the scale office at the entrance to the upper yards can communicate with both hoist operators on the river front, with the bag cement storage building, with the garage, with the batching floor of the plant, and with the head house over the batching bins. Similarly, the man who is stationed at the head house over the batching bins can advise the hoist operator in the lower yard when a particular size of material is in short supply, and the latter can relay instructions to the harbor boat to bring in a bargeload of the required material. The free interchange of information between the various stations prevents the confusion, misunderstandings and delays that could easily hamper so complex an operation. In all but a few instances the system provides two-way communication.

Operations of the new plant have not so far utilized its full capacity. Officials of the company believe, however, that the plant will readily batch up to 2,000 cu. yds. of concrete in a 9-hour day, which would place it among the largest units in operation today.

Iron City's concrete operations are carried on under the name of an affiliated concern, Vang Ready Mixed Concrete Company. Four plants are operated in all: two in Pittsburgh, and one each at McKeesport and West Elizabeth, Pa. Miss C. M. Koch is president of Iron City Sand & Gravel Corp.; William S. Giles is president of the affiliate, as well as chairman of the board of the parent company; and C. A. Bickel is vice-president in charge of all operations.

Dee G. Wheeler, manager of the Celocrete Department of the Celotex Corporation, died on October 21 in Chicago. Mr. Wheeler had been with Celotex since 1938 and was associated with other building materials firms previously. He was 62 years old.

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The Design and Engineering Of Steam Curing Installations For Concrete Block Plants

By WILLIAM J. SHORE, M.E.

Part II

FLEXIBILITY OF FOUR-KILN DESIGN

The great majority of block plants originated as small ventures, with daily production of about 250 blocks per hour, or 2,000 per day. Because of the ever-increasing demand, many small plants have developed into huge operations with outputs of 40,000 to 50,000 blocks per day. For expansion purposes the four-kiln battery is the ideal setup. As shown in the accompanying sketch, the first kiln installation sufficient to take care of 2,000 blocks per day in one shift, and 4,000 blocks per day in two shifts, is a battery 36 ft. 4 in. wide and of 31 ft. 2 in. long, a small affair.

Should production be doubled, it will be necessary merely to extend the length of the kilns by 22 ft. 6 in. Should production be tripled, a second 22-ft. 6-in. extension will be needed for an output of 12,000 blocks per day, a substantial amount of block production. Once the first four doors have been paid for, there is no additional cost for doors.

Some block builders build oversize kilns when they start in business to take care of future growth. Actually, while the method seems sound, it really is not correct. Because of the oversize kiln, the steam requirements will be excessive because of extra radiation losses, and steam curing costs will prove excessive. The extra cost of the larger kiln, that is to say, the money used for the oversize kiln could have been used for other purposes to greater advantage. The smaller (correct) size of kilns would produce cured block at less cost.

BLOCK TEMPERATURE

Based on observation in the field, nine out of ten blockmakers know nothing about temperature changes taking place in the blocks in the kilns during the heating cycle and the soaking and curing cycle.

It is important to know the temperature of the blocks throughout the entire curing cycle because with complete knowledge of thermal conditions during the curing cycle the block-maker promotes a controlled cycle and thus knows that each batch of blocks is precisely of the same quality as the preceding one. Uniformity of production quality is an important requirement for all modern processing. It is achieved only through obtaining visual and indicating records of the process in all stages.

Complete knowledge of temperature conditions in the curing kilns furnishes the following data: temperature of blocks at all times; rate at which temperature of blocks is increased; top temperature for steam control shutoff; rate at which temperature is decreasing during soaking and curing period; and temperature of blocks at unloading time.

A temperature rise that is too slow indicates lack of sufficient steam or lack of sufficient insulation. Too rapid a rise indicates too much steam. A temperature drop from maximum temperature at too high a rate indicates lack of sufficient insulation. A slow and steady decrease indicates excellent insulation.

As a rule, temperatures in block kilns are always on the low side. This is due to lack of sufficient steam pressure, insufficient quantities of steam, and the usual lack of insulation.

The installation of proper temperature indicating and recording equipment will show up these conditions instantly and thus permit the operator to make whatever changes are needed to improve operation. To cure blocks without temperature recorders is much like traveling in an unknown country without a compass. Many times the steam supply to a kiln is left open, even though no further increase in temperature may be achieved. This serves only to waste fuel and also to load the blocks with surplus quantities of water which actually affect ultimate strength adversely. Too much water on the blocks actually reduces block strength.

Not many blockmakers know the effect of cold weather and strong winds in removing heat from the kilns. Watching a thermometer after the steam has been shut off will tell instantly how much heat goes through the walls, the roof and the floor of the kilns. A concrete roof may be strong and solid, but as far as heat is concerned it is just a sieve.

KILN DOORS

Preparations for the design and installation of kiln doors are generally made 30 to 60 days after the plant has begun to make blocks. Block making machinery, mixers, bins, elevators, and kiln enclosures are all planned in advance. Even though it is known that doors will be required, they are often the last items installed; and since by then the money may have run out, they may be made up of odd lumber around the place and barn hinges. Such a makeshift door will last a matter of a year, and then it will have to be patched up. During the course of operation such doors often have pieces of burlap hung about their edges, in an effort to keep the kilns tight and hot.

Kiln Door Troubles Unless doors are supplied by kiln door specialists, the following troubles are likely to appear:

Because a tight seal is lacking, cold air enters the kilns and steam escapes.

Absence of insulating qualities causes heat to pass through the doors to the outside.

Galvanized sheet metal doors corrode and rot.

Doors which swing open on a vertical axis block up passageway, use valuable space and can seldom be kept tight. They also require counterweights, involve hoist problems, are costly, not tight, and often demand headroom that does not exist.

Those operating on a horizontal axis block passageways; they are heavy to lift and require the use of an electric or hand hoist, both of which operate slowly. Mechanical hoisting equipment is costly.

Homemade doors are only a little cheaper than those made by kiln door specialists. They require frequent repairs; they give poor service; and over a period of three or more years they prove more costly than manufactured doors built especially for kiln service and duty.

Most kiln door builders supply devices permitting the easy removal and shifting of doors. Such equip-

ment is extremely effective, reasonably priced, and durable.

An incident relating to the installation of new kiln doors is especially interesting to confirm the previous remarks relating to kiln doors. A large block manufacturer ordered a new type of curing equipment to get better and speedier curing operations. While awaiting delivery of the new curing equipment, the doors had arrived and were promptly installed in place. With the new doors functioning, the change in curing operations was almost miraculous. The customer stated that blocks came to heat in almost half the time formerly required; steam consumption had been materially reduced; there was less water on the blocks and in the kiln; and the color of the cured block had improved, making the product far more attractive in appearance. Shortly after the doors had been in operation, the new curing equipment arrived. It was placed in a storage warehouse and no effort was ever made to connect it and put it into operation. Good, tight doors on kilns are important and well worth their cost. Provision for the installation of proper kiln doors should be made before the first block is laid in place for the new group of kilns.

If the proper type of structural steel is installed for the door openings while the kiln is being built, there is no additional cost for later alterations, and no higher cost than normal kiln construction. When the kiln is completed, new doors with carriers may be procured at costs varying from $1.60 to $2.25 per square-foot door area.

Number of Doors Some kilns have doors only at the front entrance; others have doors at both front and rear. As far as loading operations are concerned, the rear door is useless. Rear doors are useful only if blocks are stored directly in the rear of the kilns.

If blocks are stored to the right and the left of the kiln proper, rear doors do not effect any economies. They do permit more rapid unloading of kilns. Many blockmakers who had originally installed two sets of doors per kiln have removed them, feeling perhaps that any slight advantages in time saving were offset by increased leakage and repairs.

ELECTRIC LIGHTING

No electric installation of any kind should be installed in block curing kilns. Conduits, wires, and fittings do not withstand the corrosive vapors that circulate within kilns during the steaming cycle. No matter how carefully installed, the materials sooner or later fail. What is more important, however, is that electric installations constitute a life hazard. Because all kilns have wet and moist floors, should a workman attempt to replace a lamp in a defective socket, he could easily be electrocuted.

To produce light in the kiln, a special portable arrangement mounted at the entrance of the kiln consisting of a 200- or 300-watt lamp in a special type of substantial reflector would serve the purpose safely and adequately.

EXHAUSTING STEAM VAPOR

Where kiln space is inadequate and kilns must be unloaded before the blocks have cooled to surrounding temperatures, there are created clouds of vapor which enter into the working space. To avoid the creation of these vapors it is necessary to vent the kilns before attempting to unload the blocks, thus cooling the blocks and also removing the steam vapors to the outside. This is done by exhausting from the top of the kiln and drawing cold air from the front and rear entrances of the kilns.

If the kiln has two doors, the vent should be in the center of the roof. If it has only one door, the vent should be at the opposite end of the kiln in the rear wall. For two-door installations, the exhaust blower is on the roof; for one-door installations, it is generally on or near the ground behind the kiln wall.

Most venting installations fail to function properly because the principles involved are not understood. Whether the air is to be taken from the rear wall or the roof, the discharge opening should run the entire width of the kiln, which in this case would be 8 ft., and the width of the opening should be at least 15 in. Most installations fail to give proper results because exhaust ducts are hardly over 4 ft. square, that is 2 by 2 ft.

The size of blower to be used and the amount of horsepower motor required should be sufficient to remove the complete air content of the kiln in one minute. In each instance there should be a metal damper, which is normally tightly closed, but which is opened during the period when the kiln is being exhausted. It is important to note that doors at one end or both ends be opened during this period so that the opening area is equivalent to a total of 8 to 12 sq. ft. Unless these conditions are complied with, results will be insignificant and of no real value.

A duct on the roof may be built of block and should have an inside area of at least 8 sq. ft. A duct at the rear outside the kiln should have an equivalent area. Restriction of outlets and inlets, together with insufficient blower capacity, will make such a system of no effect.

An exhaust blower with an impeller of the type used for shaving exhaust systems will serve the purpose best because of its rugged construction. A period of at least 30 minutes should be allowed for operation.

STEAM GENERATING SYSTEM

Because the use and application of steam in the block processing is a secondary feature in block production, most blockmakers are not too familiar with the underlying techniques of steam production and steam applications. For these reasons, the following exposition is elementary in its context and purposely so to make it possible for blockmakers to have a better understanding of this phase of the steam curing process.

Steam Applying heat in sufficient quantities to water, we produce an invisible gas called steam. When steam comes in contact with a cooler substance, it changes from gas back to water. Usually it forms clouds of vapor which deposit their moisture on whatever objects they come in contact with. When steam changes to water, it gives up the heat which was required originally to change water to steam. It is this heat that gradually heats the blocks in the kiln.

Steam may be had at any pressure, 1, 2, 5, 15, 60 or 125 p.s.i. Steam pressure, in a sense, is the same as the pressure of water coming out of a pipe. The amount of steam delivered to a kiln is generally listed as so many pounds of steam per hour, or so many horsepower of steam, where a horsepower is roughly 30 lbs. of steam per hour delivered.

Steam is at different temperatures corresponding roughly to pressure. Steam at low pressure, say 5 p.s.i., has a temperature of about 218 deg. F., whereas steam at 100 p.s.i. has a temperature of around 350 deg. F.

If we desire to heat material to certain temperatures by means of steam, the steam having a high temperature and pressure will get heat into the object to be heated

more quickly than steam at low pressure and low temperature.

To illustrate this in a simple and homely manner let us imagine two large tanks of hot water. In one we have water at 100 deg. F. and in the other tank we have water at 210 deg. F. One tank has water twice as hot as in the first tank.

We lower and submerge in each tank a standard block, both units being the same in all respects. We wish to heat these blocks up to 100 deg. F. Which of the two blocks will reach 100 deg. F. first? It is obvious that the block in the tank containing water at 210 deg. F. will heat up faster than the block in the water at 100 deg. F.

This illustrates the point that block heating is accelerated through the use of high-pressure steam, say 100 p.s.i., as opposed to steam at low pressure, say 10 p.s.i. The reason that it often requires such a long time to raise block temperatures is that there is not sufficient temperature difference in the steam and the blocks. This is particularly noticeable when blocks reach 140 deg. F. Beyond that temperature it takes a much longer time to raise block temperatures. This is due mainly to lack of heat in the steam and is also aggravated by heat losses through the roof, floor and sidewalls of the curing kilns.

STEAM BOILER SIZES

Two requirements determine the size of steam boilers for steam block curing systems. These are the number of blocks to be cured per hour, and the length of time over which steam is to be admitted per kiln.

Secondary modifications of these primary requirements are as follows: kiln construction, dimensions, type of walls, type of roof, type of doors, type and degree of insulation integral and applied to kiln structure; number of kilns on hand and schedule of operating procedure, number of shifts, hours of each and spacing of same; extra uses of steam, such as cleaning block machinery, hot water for employees, hot water to heat water for aggregates, hot water for thawing aggregates, heating plant, etc.

The following schedule has been prepared to correspond with the previously described method of building kilns, where there are four kilns of 8 ft. width per battery and where there is ample insulation and tight, well fitting door closures. The boilers listed are of sufficient capacity to cure blocks at the hourly rate shown and for a total capacity of 16 times this amount per 24-hr. day during mild weather. The boiler capacity will not cure the same amount of blocks in the coldest weather, but since in cold weather the demand for blocks drops to one-half of normal requirements, the capacity as listed should meet the requirements.

No allowances are made for steam for heating structures, aggregates, and water or other miscellaneous services. In actual practice such matters should be given individual attention.

Steam Boiler Capacities for 8-in. Block Production*

Blocks per Hour	Horse Power Steam Generating Units
250	1-15
500	1-30
750	1-50
1000	1-75
1500	1-100 or 2-50
2000	1-150, 2-75 or 3-50
3000	1-200, 2-100 or 4-50

*Figures apply to both cinder and concrete blocks. While the former require higher curing temperatures than concrete blocks, the difference in weight practically compensates for the difference in temperature requirements.

Since most plants gradually enlarge their capacities from time to time, the possibilities are that multiple groups of boilers are the more common type of installation. In a sense, it is sometimes a more flexible operating system if one steam generator is applied to one block machine and also to one group of kilns. Thus, there can never be a complete shutdown. However, this is a matter of individual choice and opinion.

Steam Generating Units Modern improved design and the more intensive use of principles governing the more rapid transfer of heat from fuel to water have created the modern so-called "Package Unit." These units comprise complete power plants, together with a high skill in design, high operating efficiency and remarkable reliability in performance. They are easy to install and require no skill or trained attendants for operation.

New high pressure steam generating units through their original design are permitted to operate without licensed attendants; thus the blockmaker can be assured of more rapid heat input through the use of the high-pressure high-temperature steam supply. Complete protective devices render these equipments completely automatic, and ample service facilities make it easy to assure continuous trouble-free operation. Fuels are highly varied—oil or gas, natural or manufactured, propane or butane. Efficiencies of heat conversion run close to and sometimes slightly over 80 percent, which is tops.

CONCLUSIONS

Good block curing is not a matter of luck or chance. Careful preparation and planning are required to acquire a good curing assembly. A good curing plant can be installed at a cost not greatly exceeding a hit-or-miss job. Improvisation has no place in the block curing installation. In general, it is found that the cost of a first-class complete curing plant, including kilns, doors, boiler plant, and installation will range between $15,000 and $20,000 per 1,000 blocks produced per hour or 16,000 blocks per day.

Sound advice to the prospective blockmaker who plans on making the installation of a modern steam curing system is the admonition to *"Do it right the first time."*

Herman W. Forste, president and secretary of the Oakley Concrete Block Company, Inc., Cincinnati, O., died on October 3. Death came as a result of a stroke suffered earlier on that day. Mr. Forste had been active in the concrete block business since 1917. Mrs. Emma Forste, his widow, is the vice-president and treasurer of the firm. Mr. Forste was 61 years of age.

M-K Lime Process wins OK of Concrete Producers

The patented MILLER-KOMLINE Process of producing superior lime putty makes the Ready Mixed Brick Mortar market available for ready-mix concrete operators.

Product requires no aging, and is ready for use right after slaking. Can be mixed with sand and Portland cement and delivered via transit mix trucks.

Inventors will design and erect plants, and install apparatus on *exclusive patent license.*

Mat of processed lime putty being carried over outrigger roller of M-K machine by helical springs.

Write for Full Details

MILLER - KOMLINE CORP.

Sole Licensees of M-K Process

PEAPACK, NEW JERSEY

Durando Miller Thomas R. Komline

Concrete Pipe Made at Location

By GEORGE W. HOFFMANN

another P&Q exclusive

THE rapidly increasing demand for larger and larger sizes of sewer pipe lines is inducing many concrete pipe manufacturers to use decentralized plants and to make their pipe either at location or at least close to the location where it will be laid. The portable concrete pipe plant is therefore something our pipe machinery manufacturers here and abroad are much concerned about.

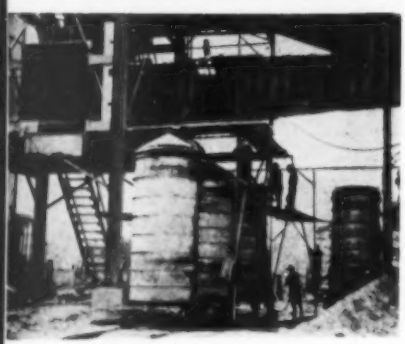
In South American and Far Eastern markets, where road conditions are poor and transportation is very costly and difficult, even small size pipe lines from 18 in. (46 cm.) and up have been made at location in so called hand-cast forms, which were either vibrated or hand tamped after a portable concrete mixer had filled the molds. The forms were then left to set for a day, stripped, and cured with water spray. The result is a first-class pipe made right alongside the ditch. However, when a pipe job calls for 60-in. (1½-meter) inside diameter and 144-in. (almost 4 meters) in length, such plants begin to take on different forms.

Some time ago the Thomas Concrete Pipe Company of San Antonio, Tex., had a contract which called for laying pipe out in the open fields far from their home plant. Here is how they solved their production problems with top efficiency in every detail and how they were able to deliver a completed pipeline at record speed.

The first step was the erection of a ready-mix plant complete with overhead storage bins for aggregates and bulk cement. Next a narrow-gauge rail track was built which had two switches, permitting operation as if the track were built in a perfect circle to fit the circular production flow. Rolling steel frames

(Continued on page 142)

• The core has been removed from a 60- by 144-in. tongue-and-groove pipe and set on the small car in the foreground, and reinforcing steel is being placed around it.



• Above, left: Stripped pipe is in the background. The jacket is being placed around the core and reinforcing in the foreground.

• Left: Batch-mix plant. The form in the immediate foreground is assembled for filling. The center form is being filled, and the third form is receiving the tongue. The form at the right will move down over the switch to the filling track.

• Right: General view of the plant looking toward the batching and filling station.

• Filled forms being cured by steam jets. After two hours of steaming, the forms are removed, and the car with the pipe and pallet goes to the steam curing room for 24 hours.

• In this shot the crane is removing a 72- by 144-in. pipe from the car for stockpiling after 24 hours in the steam curing room.

18 Units per Minute On Princes' New Machine Is Just "Loafing" Pace

By HARRY F. UTLEY

another ON THE SPOT report

IN our travels through the West we enjoy dropping in at the concrete-products plant of William H. Prince & Sons in Salt Lake City. For, although the Princes are always busy on the production and merchandising end of their broad line of masonry units, they are usually also developing some new wrinkle, some advanced idea in production methods, or tinkering with an entirely new product!

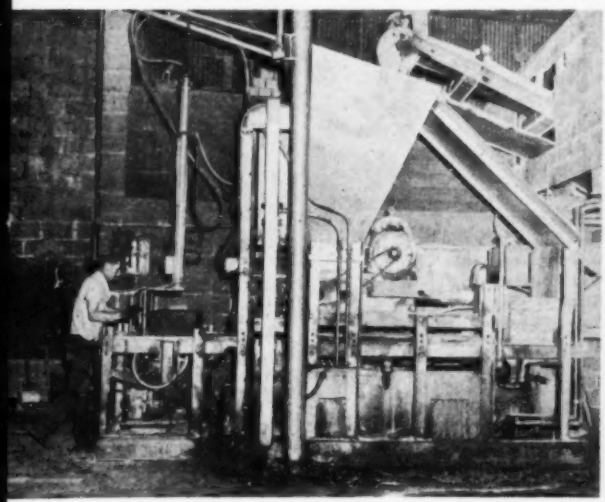
In July, 1950, we stopped in full of anticipation . . . . nor were we disappointed. We discovered them in full production, using a new fully-automatic block machine of their own design with just about the greatest capacity in operation anywhere. Using an air-operated off-bearing hoist, the machine, which has been named the "Prince Tri-Hydro-Tron", was actually loafing along at six cycles per minute, making three standard 8- by 8- by 16-in. units per plain pallet—or 18 per minute. Output could be stepped up to 24 or 30 per minute, in the opinion of William Prince, but this is far too fast for conventional off-bearing methods. On the drawing board in the Prince engineering department, however, plans were nearing completion for a continuous curing kiln which will take the green units directly from the machine into the kiln without handling. When this is built and in operation, some time next year, the full capacity of the machine can be utilized with the steam-cured units coming out at the yard end of the continuous kiln ready for automatic stacking by another Prince brain-child.

The Tri-Hydro-Tron machine was built and perfected over a 2-year period and now runs hour after hour on a 2-shift day and seldom requires attention other than ordinary maintenance. All controls are electrically-actuated and hydraulically-operated; aluminum pallets are stacked at the rear end and fed automatically. A 4-stop system maintains positive height control over the entire pallet electronically within the close limits of .005 in. Density of the concrete is likewise regulated through control of both pressure and speed and amplitude of vibration; once the density-control lever is set for a particular type of unit or aggregate mix, further attention is seldom required during a run. Front and side views of the machine are shown in accompanying illustrations.

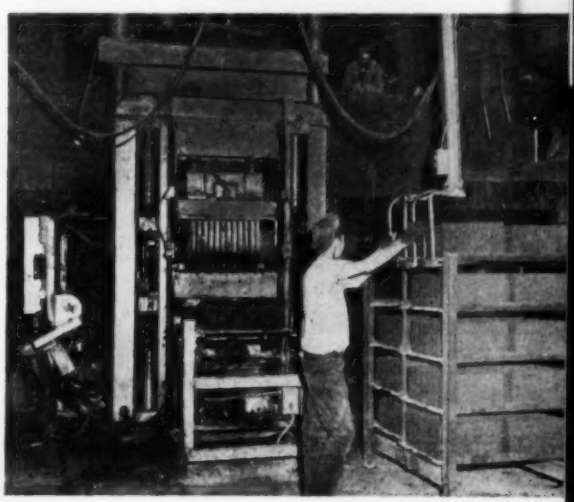
The new machine is currently being used to advantage in the production of a new type of veneer unit known as "Princestone". Laid up in the wall, Princestone is, in appearance, similar to flagstone and, although introduced only recently, it is enjoying widespread popularity among Salt Lake City architects and the building fraternity in general. Exposed surfaces of the units are rough-textured. They are made in a variety of pastel colors which may be combined or used alone with contrasting raked mortar joints for best effect.

The standard Princestone bricks

• William H. Prince behind the office counter, which was built of Princestone units.



• A side view of the fully-automatic block machine developed at the William H. Prince & Sons plant, showing the concrete hopper and rear pallet feed.



• The off-bearer at the front end of the high-capacity machine. All controls are grouped in panels at the left.

• A closeup of the cracked units, showing rough-textured faces.

• This commercial building in Salt Lake City has a Princestone veneer front.

are molded, 9 per cycle, as solid units 2 in. thick, 8 in. wide, and 15⅜ in. long. After curing, each unit is cracked and broken lengthwise in a hydraulic-powered guillotine to produce two finished units 2- by 4- by 15⅜-in. The crack-and-break method imparts the rough texture to the exposed side of each unit.

The company makes regular concrete, cinder, and pumice blocks, the Princestone units utilizing pumice aggregate. New equipment, including a McLanahan & Stone cinder crusher, and an Overstrom 2-deck screen, are being installed this autumn to process furnace-run cinders at the Prince plant.

Elmer F. Meek, an engineer at the Haydite Block plant at New Market, Mo., died on November 4 at his home in Wallace, Mo. He was 46 years of age.

N.C.M.A., U. of Wisconsin Report on Curing Project

According to the *N.C.M.A. Reporter*, news sheet published by the National Concrete Masonry Association, the association and the University of Wisconsin Engineering Experiment Station have cooperated in an investigation of the effect of certain differences in curing on the compressive and tensile strength and other physical properties of concrete block.

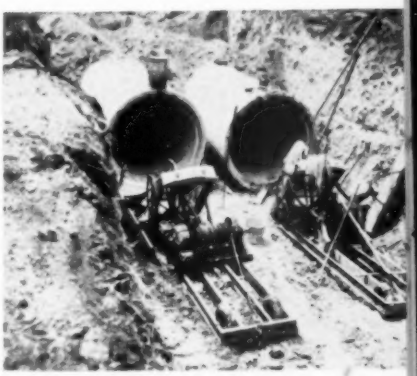
With the laboratory work completed, a preliminary draft of the project report has been prepared for review and comment.

Frank A. Wicklund, 34, was the victim of a fatal accident, which occurred while he was cleaning a concrete block molding machine at the Anchor Block Company, St. Paul, Minn. Failure to tell other employees that he was cleaning the press was responsible for the accident, according to company officials. He was fatally injured when a fellow-worker turned on the mechanism.

Officials of Dominion Building Materials Limited of Montreal and Ottawa have announced the purchase of Ready Mix Concrete Limited of Montreal and of Ontario Ready Mix Concrete Limited of Ottawa. The business of the merged concerns will be carried on at the same locations under the name of Dominion Building Materials Limited.

James H. Snowden, president of the Texcrete Company of Dallas and Fort Worth, Tex., has been named chairman of the board and George A. Meihaus was elected president of the company. Mr. Meihaus, who is also president of the Texas Concrete Masonry Association, was executive vice-president of the company before being elected president.

• Left: Here the dragline is shown digging a trench for the pipeline. Note two pipe sections in background.



• Right: Pipe ready for backfill. These sections were made for and laid with rubber gaskets. Jacking devices were used for joining the pipe sections.

Concrete Pipe at Location

(*From page* 140)

were set on the track, each carrying its 60-in. Quinn groove pallet welded right onto the portable platform. The third step was setting up the curing shed not far from the mixing plant, right down the track line.

Thus, the special 60- by 144-in. Quinn forms were filled underneath the mixing plant, while vibrators mounted on a special rigging inside the forms assisted in compacting the concrete in the forms. When properly filled, the forms were moved to the curing shed for steam curing. After removal from the shed the cars were rolled alongside the track and with a standard portable crane the pipe was stripped and removed to a storage space. Then the Quinn forms were reassembled, the reinforcing wire mesh was set in place and the form was returned to the mixing plant for refilling.

After the contract was completed, mixing plant, rail track and curing shed were quickly removed and are serving today at another site.

Strestcrete Structures Featured by Basalt Rock At California State Fair

• Above: The Strestcrete exhibit at the California State Fair.

• Right: Strestcrete wall sections, 8 by 20 ft., being set in place.

The speed of pre-fabrication, combined with the strength and security of concrete, was illustrated by an entirely new construction development of the Basalt Rock Company, Inc., Napa, Calif., at the California State Fair last summer in Sacramento.

The "Strestcrete" integral steel frame building erected at the fair demonstrated the construction of walls from pre-assembled panels, each 8 ft. wide and 20 ft. high.

Individual tongue-and-groove wall sections were plant-assembled with integral steel columns which were welded to plates in concrete piers at the job site. Roof girders fabricated from steel plate, fusion welded, spanned the 50-ft. opening and carried a Strestcrete slab roof.

To illustrate the commercial type of building, a typical corner section was displayed. This demonstrated the use of the combination of the tongue-and-groove wall section, girder and Strestcrete roof slab, all pre-assembled in such a manner that parapet walls were constructed without the use of forms.

A typical section of the new tongue-and-groove pre-assembled wall and slab roof construction for low-cost, volume home building was also shown.

Biloxi Concern Announces Birthday and New Service

When the Biloxi Concrete Products Company of Biloxi, Miss., installed its new Multiplex block machine and at the same time observed the fourth anniversary of its founding, the proprietor considered this double feature newsworthy. He inserted the accompanying announcement in a local newspaper.

The new equipment produces seven blocks per minute and under 10,000 lbs. of pressure. Block size can be changed, and plain pallets insure uniformity. Cost of the new machine was $15,000. The concern is headed by D. G. McBryde, who is owner and manager.

Members of the Concrete Products Association of Detroit recently held their general meeting at the Fort Shelby Hotel in Detroit. The speaker was Harry M. Steffey, assistant director of the Federal Housing Administration for the district of Michigan. Representatives of 14 block manufacturers, three cement companies, three equipment manufacturers, and others were present.

The ad was about twice the size of the illustration.

4th Anniversary

Tomorrow, Oct. 28th

we observe our fourth anniversary and with it realize the improvement of our plant to better service our patrons.

We have recently purchased and now have installed a $15,000 Multiplex hydraulic plain pallet machine, that insures uniformity in block size. This new machine produces 7 blocks per minute, and can be adjusted to make all sizes and types of concrete blocks.

In addition to concrete blocks, we can service our customers with: Sand, Gravel, Mortar Mix, Reinforcing Steel Rods.

And at this time, our 4th birthday, we wish to thank our many friends and customers for their patronage, because it was through you we have been able to improve our plant to be one of the most modern on the Coast.

Biloxi Concrete Products Co.

562 Oak street, dial 5182, Biloxi
D. G. McBryde, Owner

Mortarless Block Company Now Perma-Lite Products

At Marysville, Wash., the Mortarless Block Company's facilities will be expanded and essentially altered, and the company name will be changed to the Perma-Lite Products Company.

After much research and thorough experimentation the company officials have installed a Lith-I-Block automatic machine which will turn out units of many sizes and shapes. Materials to be utilized include lightweight pumice, as well as "standard" concrete aggregate.

European Scientists Honored For Concrete Research

Two European scientists, Gustave P. R. Magnel of Belgium, and Eugene Freyssinet of France, recently received the Frank P. Brown Medals of the Franklin Institute, Philadelphia, Pa., at the organization's annual Medal Day ceremonies.

The medals were awarded for their work on the use of pre-stressed concrete. Mr. Magnel's method was used recently in the construction of the Walnut Lane Bridge in Philadelphia's Fairmount Park.

You get it—with a Cleveland Air Vibrator. Whether it's gentle persuasion your equipment needs, or powerful, hammer-like blows, there's a Cleveland Air Vibrator to keep production at peak efficiency, at minimum cost.

TYPE "F"

Type F is a rugged and powerful Cleveland Air Vibrator – readily adaptable to screens, chutes and hoppers... Type LSRR is a workhorse, equipped with a cast steel male bracket which fits snugly the female bracket that is standard equipment on most covered hopper railroad cars.

TYPE "LSRR"

Type UH is a quick attachment air vibrator, for handling equipment requiring vibration for short intervals, and on which a permanent installation might impede production.

TYPE "UH"

Our portable lightweight – Type SA, for light applications of speeding and feeding the flow of materials – comes equipped with swivel connections to save hose. Won't kink or buckle.

TYPE "SA"

Hard-chrome plated pistons assure starting and smooth operation on *all* types of Cleveland Air Vibrators. Catalog No. 105, giving complete details, is yours for the asking.

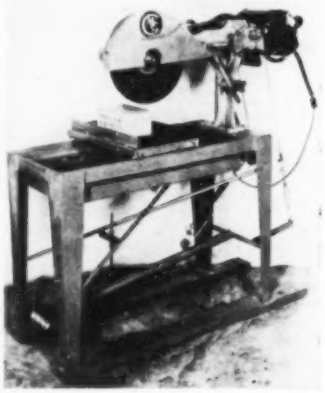
THE CLEVELAND VIBRATOR COMPANY

2707 Clinton Ave. • Cleveland 13, Ohio

NEW MACHINERY and SUPPLIES

● Masonry Saw

The Construction Machinery Sales Company of Waterloo, Ia., has recently announced the marketing of a new masonry saw for wet and dry cutting. This new unit employs a different method of design that unitizes the cutting head, arm and motor so as to permit alignment adjustments off the rigid column, mounted directly to the jig-welded steel frame. This makes possible perfect blade alignment in relation to the cutting table, thereby greatly increasing blade life.



Another feature, unique to the new saw, is an independent centrifugal pumping unit complete with its own power, used to circulate the coolant liquid during wet cutting operation. This is extremely important, since it eliminates all belt drive, power take-offs and consequently increased load on the motor driving the cutter blade. Also, to minimize damage to the impeller and the case of the pumping unit, due to possible abrasive action of the coolant liquid, both these parts are made of wear-resistant rubber.

In addition to these two basic design innovations, the unit features smooth operating foot feed, indexed adjustment for cutting height control, locking arrangement for plunge cutting and scoring, and V-shaped ball-bearing-equipped material feed cart. Both the cutting arm and the column are of cast aluminum.

● Overhead Guard

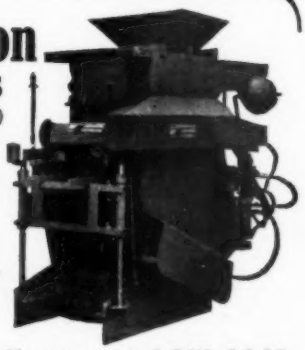
Maximum protection for operators of Towmotor fork lift trucks is achieved by adding an Overhead Guard device that shields him from falling objects. The guard is constructed of sturdy steel pipe and is securely fastened to the frame by bolts and clamps. Lift trucks may also have this safety device added. Sizes for all models of lift trucks are available from Towmotor Corporation, 1226 E. 152 st., Cleveland 10, O.

High Production of SUPER BLOCKS

(SMOOTH FINISH – SHARP EDGES)

the FLEMING WAY

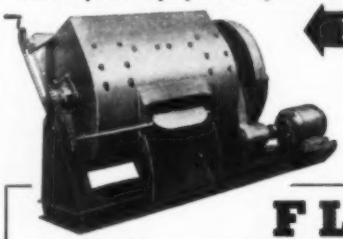
A Block Plant tailor-made to suit your requirement and expenditure. Any capacity from 1000 to 5000 per day.



FLEMING FMC 180

AUTOMATIC CONCRETE BLOCK MACHINE

The quality plain pallet vibrator at LOW COST



FLEMING FMC 24

PLANT MIXER

Delivers a perfect concrete mix to one or more machines.

Priced as a TWO sack Mixer with THREE sack Drum and Gear Reduction Capacity.

WRITE FOR BULLETINS

Phone Flanders 7800

FLEMING MANUFACTURING CO.

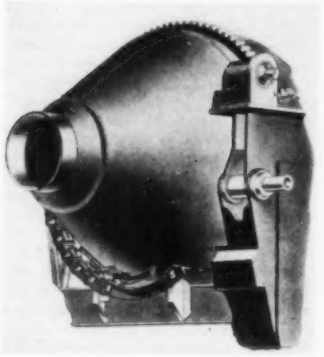
4989 FYLER AVE. • ST. LOUIS 9, MO.

COMPLETE CONCRETE BLOCK PLANT EQUIPMENT

● Tilting Mixer

Supremix Inc., an affiliate of Gene Olsen Corporation, Adrian, Mich., claims for its Supremix "Tilting Mixer" many features which make it an outstanding piece of equipment for new plants, and for those converting from dry batching to central mixing.

The Supremix Mixer is an integral part of the plant structure, eliminating elevated foundations or separate mixer platforms. Due to its unique tilting arrangement, the mixer is located lower in the structure, saving headroom and giving lower overall plant height. The mixer tilts hydraulically and discharges as if pouring from a coffee pot without splash



or spill and without discharge segregation. By this method of tilting, no collecting hopper is necessary, as the mixer tilts directly into the delivery equipment. The power source is external of the mixer tilting frame, thus allowing for diesel, gasoline, or electric power.

Due to its design the Supremix plant allows for two lines of traffic, one for central mixing and one for dry batching, using the same scale and batching facilities. Ease of conversion can be accomplished without raising present bin structures or depressing driveways.

The blades of the Supremix, it is claimed, effect a rope action exchange of mixing the ingredients from the ends of the mixer, causing a continuous action of kneading, twisting, and pouring, with less dropping and splashing.

The operator of Supremix plants is stationed in front of the mixer where he can see all functions, correctly weigh all materials, note the charging of the mixer, check consistency, make any necessary corrections before discharging, and see and check all delivery equipment before loading. This ease of visual inspection, according to the manufacturer, benefits both owner and inspection engineers and facilitates the production of controlled concrete at no additional cost.

At Gooding, Idaho, a new ready-mixed concrete plant was recently opened by Titus, Inc., of Jerome, Idaho. Marvin Harp, general manager of Titus, Inc., will be in charge of the plant.

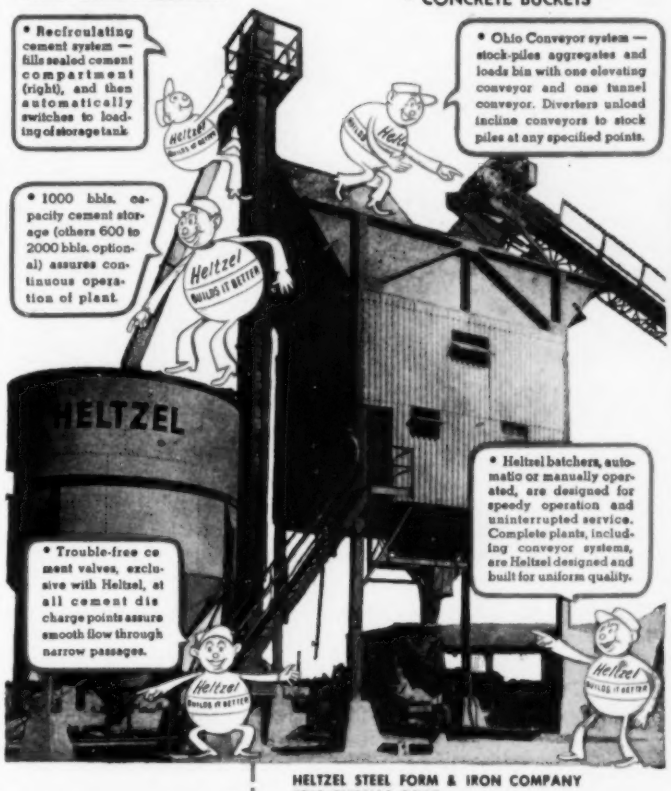
Heltzel BUILDS IT BETTER

HELTZEL

SUPERIOR *Batching Plants*

• More efficient batching plants will effect savings for you in operation and plant costs. Heltzel's specialized engineers work out your specific problems on both stationary and portable installations, ranging in capacities from 30 to 500 tons. Why not let a Heltzel representative explain exclusive features and Heltzel's better construction.

- CENTRAL MIX PLANTS
- TRANSIT MIX PLANTS
- BULK CEMENT PLANTS (Portable and Stationary)
- AGGREGATE BATCHING PLANTS (Portable and Stationary)
- CONCRETE BUCKETS


• Recirculating cement system — fills sealed cement compartment (right), and then automatically switches to loading of storage tank.
• Ohio Conveyor system — stock-piles aggregates and loads bin with one elevating conveyor and one tunnel conveyor. Diverters unload incline conveyors to stock piles at any specified points.
• 1000 bbls. capacity cement storage (others 600 to 2000 bbls. optional) assures continuous operation of plant.
HELTZEL
• Heltzel batchers, automatic or manually operated, are designed for speedy operation and uninterrupted service. Complete plants, including conveyor systems, are Heltzel designed and built for uniform quality.
• Trouble-free cement valves, exclusive with Heltzel, at all cement discharge points assure smooth flow through narrow passages.

WRITE FOR BULLETIN

HELTZEL STEEL FORM & IRON COMPANY
1760 THOMAS ROAD
WARREN, OHIO, U. S. A.

Please send information regarding:

Stationary Batching Plants ☐ Road and Airport Forms ☐
Portable Batching Plants ☐ Curb and Gutter Forms ☐

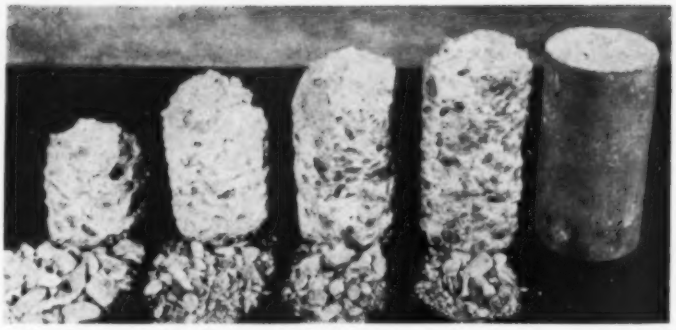
FIRM _____
ADDRESS _____
CITY _____ STATE _____
SIGNED _____

HELTZEL STEEL FORM & IRON CO.
WARREN, OHIO · U. S. A.

● Asphalt Emulsion Admixture

"Hydropel," a product of Stancal Asphalt & Bitumuls Co., 200 Bush Street, San Francisco, Calif., is a material which when used in concrete reduces permeability. It is also said to give high chemical and impact resistance, increase dimensional stability, prevent segregation, and improve bond with previously placed concrete. When mixed in the proportion of 1 to 1½ gallons per sack of cement in structural concrete, this emulsified asphalt product forms a thin water-repellent coating which is absorbed by the concrete.

Hydropel is a brown liquid of the consistency of table cream and contains 55 to 60 percent of finely-ground hard paving asphalt. It is added to the mixing water or placed in the batch after the mixing water has been added. Usually workability is maintained by withholding an amount of water equivalent to the full volume of added emulsion for high-slump concrete, and one-half the volume for low-slump concrete.



Stancal operates west of the Rockies; in areas east of the Rockies the American Bitumuls Company handles Hydropel.

In the accompanying illustration the concrete cylinder at the right, which contained Hydropel, was not appreciably damaged after 40 cycles in and out of sodium sulphate. The cylinder next to it had the same type of cement, plus 4 percent of entrained air, but no Hydropel; it failed in 18 cycles. The cylinder at the extreme left, with the same type of cement, but no air entrainment and no Hydropel, failed in 9 cycles. The other two failed after 13 and 15 cycles.

● Hydraulic Press

Concrete blocks and ready-mix cylinders can be tested easily and rapidly with a new hydraulic press being made

CHANGE TO CHALLENGE

Pays Off 3 Ways with

1 *greater payload capacity:* Challenge Mixers are manufactured **with the operator in mind.** All unnecessary weight has been eliminated completely . . . weight which is used for payload instead. Challenge Mixers weigh 1500 to 3000 pounds LESS than other mixers of comparable size, carrying a **greater legal payload.**

2 *low initial cost:* Modern, mass production methods of manufacture, together with the use of lightweight, high-tensile steel and standard industrial automotive parts and equipment permit sale of Challenge Mixers for **hundreds of dollars less.**

3 *minimum maintenance:* Elimination of discharge gate and drum seal on Challenge Mixers has eliminated the greatest single expense item. Only 4 conveniently located Zerk fittings are required for weekly lubrication. Standard automotive repair and replacement parts never present a problem . . . they're always immediately available from parts dealers everywhere.

For Your BEST Mixer Buy . . . INSIST ON CHALLENGE! Replace old, obsolete mixers now . . . *You'll Be Hundreds Of Dollars Ahead.* Complete information on request.

COOK BROS. EQUIPMENT CO.
Send me information on CHALLENGE MIXERS, including sizes, construction details, and prices delivered in my area.

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COMPANY

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CITY STATE

COOK BROS. EQUIPMENT CO.
EXCLUSIVE NATIONAL DISTRIBUTORS FOR
CHALLENGE
the modern, streamlined truck mixers

1815 N. Broadway, Los Angeles 31, Cal. Phone CApitol 2-9111

by the Budd Development and Manufacturing Company, P. O. Box 4581, Cleveland 24, O.

This machine, developed especially for the concrete industry, has an opening of 13 in. in height and platens 12 by 16 in. in size. A force of 100 tons may be exerted.

It is claimed that the use of this press should promote savings in concrete block and ready-mix plants, as tests can be made regularly, easily, and without delay. Substantial savings in cement used are possible as it is not necessary to use excessive quantities to be sure of obtaining the required test strength to comply with specifications. It has been found in company tests that at least four 8-in. blocks may be made from each bag of cement, with savings up to $10 for each 1,000 blocks produced.

● Liquid Additive

Denser, stronger, and more uniform concrete blocks and bricks may be made by adding small amounts of "Santomerse S" to the mix, reports the Monsanto Chemical Company, St. Louis 4, Mo., manufacturer of the additive.

The chemical is a liquid wetting agent, such as used in cleaning compounds, which increases the efficiency of water so that a smaller quantity is needed. At the same time the plasticity is improved, a distinct advantage in making concrete products. About 8 oz. of the product are used in a 5-bag mixture and about one third of the usual volume of water. Cleaner equipment, lighter-colored products, and better dispersion of cement are additional advantages of this material.

● Powered Hand Trucks

A powered hand truck with either gasoline ("Hydro-Lift") or electric ("Electro-Lift") power has been announced by the Industrial Truck Division, Clark Equipment Company, Battle Creek, Mich.

The new truck features a driving mechanism mounted in the drive wheel, short turning radius, high underclearance, and accessibility for maintenance.

The gasoline-powered model uses a hydraulic motor to power the drive wheel. A hydraulic pump operated by the gasoline engine supplies the necessary energy. The electric model has the motor mounted in the drive wheel and geared directly to it through reduction gears. Both types of power give smooth acceleration and ample power.

These trucks have wide applications in the handling of palletized materials, and are said to incorporate the latest in improved design and operation.

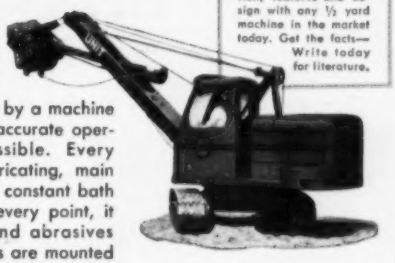
Allen Cassin has been appointed an assistant general sales manager of The Celotex Corporation, supervising operations of the company's eastern sales branches. He will have his headquarters in Washington, D. C.

For several years Mr. Cassin has been manager of the Celotex Cleveland branch, and prior to that he managed the company's Atlanta branch. W. H. McAuliffe, formerly assistant manager of the Cleveland branch, succeeds Mr. Cassin as manager of that branch.

1 of 10 Reasons Why UNIT is a Better Machine

UNIT 614—½ Yd. 25 years of engineering skill and craftsmanship have gone into the production of this outstanding model. It offers the same rugged construction usually found only in machines of greater capacity. Compare its construction, features and design with any ½ yard machine in the market today. Get the facts—Write today for literature.

The one-piece cast gear case is an exclusive UNIT feature. It provides a completely rigid enclosure for all gears, shafts, and bearings. All shaft openings are simultaneously bored by a machine designed specifically for this accurate operation. Misalignment is impossible. Every working part in this self-lubricating, main machinery case operates in a constant bath of oil. Flawlessly sealed at every point, it keeps lubricants in — dirt and abrasives out! Split drums and sprockets are mounted on large diameter shafts with short spans between bearings. This reduces deflection to a minimum, and bearing replacement is seldom necessary. It's a precision-made masterpiece of design and engineering — "The Heart of Every UNIT!"



UNIT CRANE & SHOVEL CORP.
6401 WEST BURNHAM STREET
MILWAUKEE 14, WIS., U. S. A.

Crawler and Mobile models — ½ and ¾ Yd. Excavators. Cranes up to 20 tons capacity.

SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS

A 5849-½I-C

Strictly on the SOLID SIDE!

IMMEDIATE DELIVERY $1085
The following equipment is optional and extra. Hydraulic tilt control, two speed winch, electric brakes.

the RUGGED MILLER
MODEL "B" Tilt-Top

Designed for heavy duty — this tough Tilt-Top provides easy handling of loads up to 10 tons. The all steel frame has tapered side channels 12" deep, braced with 3" deep X member. The Miller straight through axle is integral with the frame and features 3½ dia. solid steel stub inserts. Standard platform is 14'x8', optional 16' available. Platform, tires, Timken bearings, pintle eye, dual Budd wheels and hubs are all standard equipment.

RAY MILLER RESEARCH ENGINEERS
DEPT. 9120, 727 W. BURNHAM ST. MILWAUKEE 4, WIS.

● Jacking Equipment

Hydraulic jacking equipment from 50 to 600 tons in capacity, including jacking cylinders, hand and power pumps, quick couplers, and valves and hose, is offered to the nonmetallic mining industries by Rodgers Hydraulic, Inc., Minneapolis 16, Minn.

A 150-ton jacking unit is furnished in two models, No. J150A-30-4, hand-powered, and No. J150A-30-D1, powered by a Rodgers Model DiAMW-4V3 pumping unit. The Model J200A-38-D, a 200-ton unit, has an additional cylinder.

● Portable Mixer

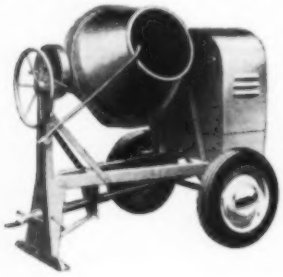
A new portable multi-blade concrete mixer has been introduced by the Multiplex Machinery Corporation of Elmore, O. Power is provided by electric motor or gas or diesel engine. Mixing time is three minutes or less for mixes of plaster, concrete, or other aggregates. The unit is complete with a discharge door located at the correct height to permit use of a standard wheelbarrow. Re-

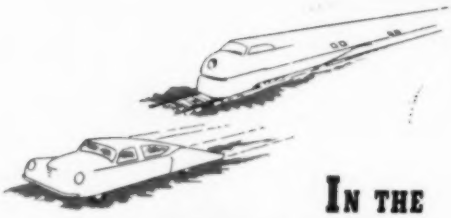
placeable liners and paddles of high-carbon steel reduce maintenance problems.

The mixer is of sturdy steel plate welded construction, mounted on a welded-steel truck with four standard pneumatic-tired automobile wheels. A tow-bar is provided on the steerable front wheels. It is produced in 3-, 5-, 7-, and 12-cu. ft. capacities.

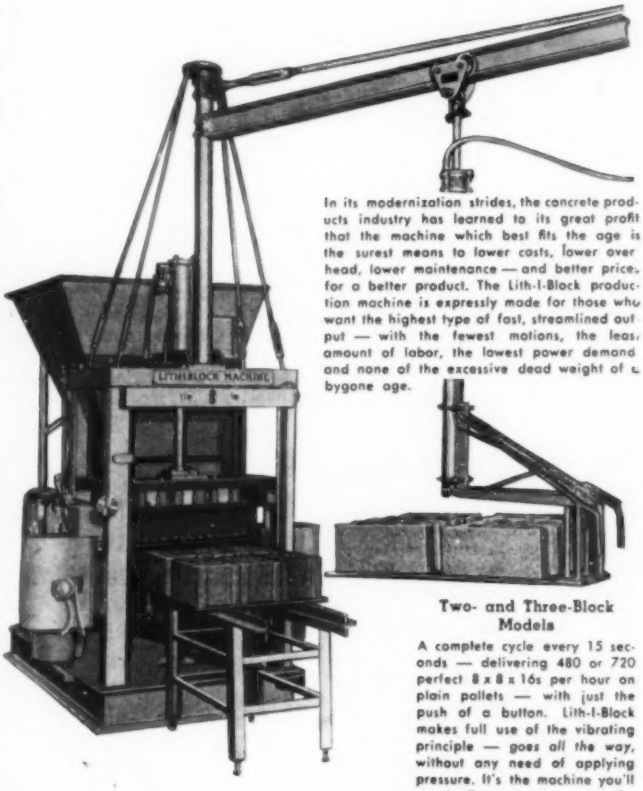
● Side-Discharge Mixer

A side-discharge, one-half bag concrete mixer, the 3½-S "Speedy" tilter, has been announced recently by the





IN THE CONCRETE PRODUCTS INDUSTRY
Lith-I-Block IS THE MACHINE THAT
FITS THE AGE

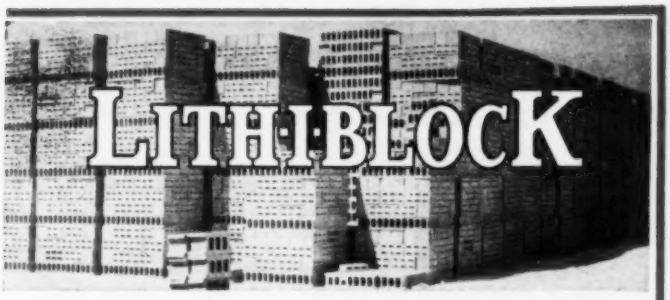


In its modernization strides, the concrete products industry has learned to its great profit that the machine which best fits the age is the surest means to lower costs, lower overhead, lower maintenance — and better prices for a better product. The Lith-I-Block production machine is expressly made for those who want the highest type of fast, streamlined output — with the fewest motions, the least amount of labor, the lowest power demand and none of the excessive dead weight of a bygone age.

Two- and Three-Block Models

A complete cycle every 15 seconds — delivering 480 or 720 perfect 8 x 8 x 16s per hour on plain pallets — with just the push of a button. Lith-I-Block makes full use of the vibrating principle — goes all the way, without any need of applying pressure. It's the machine you'll eventually come to — so why not now!

Write for descriptive literature and names of nearby users.
LITH-I-BAR COMPANY
Dept. CM 12 HOLLAND, MICHIGAN



IN THE BUILDING FIELD

***The* CONCRETE MASONRY UNIT THAT BEST**

FITS THE TIMES

After all, the only reason you have a block machine is to be in the business of making blocks that sell. If you want a building block that has more than a cellar future, more than a cheap market — then investigate Lith-I-Block! Lith-I-Block producers do not operate to a limited demand or a restricted market — they have the concrete masonry unit that best *fits the times* — one that is ideally made with the quality running true all the way thru —the kind of accuracy and uniformity and precision that gets it above the ground into the superstructures where the big volume is to be obtained — and where prestige is made for the Lith-I-Block producer. Why not ride the Lith-I-Block tide — it means more business coming your way! You'll get better quality blocks — and more to each sack of cement! Write for the convincing proof on Lith-I-Block superiority — and get in now while the getting is good.

LITH-I-BAR COMPANY
Dept. CM 12B HOLLAND, MICHIGAN

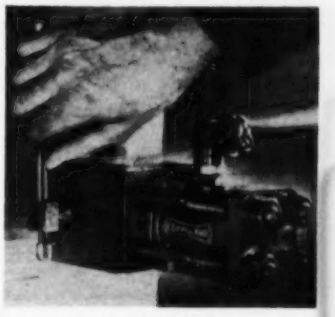
All Shapes and Sizes to Fit All Purposes
Adaptable to All Aggregates

Jaeger Machine Company, Columbus 16, O.

The drum is mounted on two Timken roller bearings and is roller-chain-driven by a 3¾-hp. Wisconsin aircooled engine. The machine is balanced for easy hitching, towing, and manuevering. The tewpole telescopes out of the way. Automotive type wheels and a wide front foot reportedly give stability for towing or operating.

● Portable Vibrator

The "Vise Grip", a small vibrator that can be attached to concrete forms, hoppers, bins, dump trucks, and other containers to shake out powdered, granular,



or semi-liquid materials is being made by the Cleveland Vibrator Company, Cleveland 13, O.

The device has a steel U-shaped head that functions as a vise to clamp the unit to any suitable structural member. The vibrator operates at 3,600 blows per minute at 100 p.s.i. to 1,000 blows at 50 p.s.i. air line pressure. Air consumption varies from 5 to 10 cu. ft. per minute depending on operating speed and line pressure.

Trade Notes

Stearns Manufacturing Company, Inc., Adrian, Mich., manufacturers of concrete block-making equipment for 25 years, recently appointed Construction Equipment Company, Inc., Spokane, Wash., as exclusive distributors for Stearns products in Washington, Oregon, Montana and Idaho, according to Claude Rowell, vice-president and sales manager of the Michigan concern. Construction Equipment Company, also in business a quarter-century, is one of the largest and oldest construction equipment houses in the Northwest, with a branch in Missoula, Mont.

Construction Equipment Company represents such other nationally-known manufacturers as Rex Chain Belt Company, Fairbanks-Morse & Company, Gar-Bro Manufacturing Company, Pacific Wire Rope Company, Mall Tool Company, Joy Manufacturing Company, Universal Form Clamp Company, and Plymouth Locomotive Works. C. A. Burnette is president, and R. E. Blackwell is sales manager.

THE NEW CURING METHOD WITH EMMONS *VAPOR-THERM

New efficiency with the *Vapor-Therm

- Steam delivered to kiln within three minutes from start.
- No initial set is necessary as the block surface is covered, immediately, with moisture.
- Vapor is generated at low pressure, high temperature.
- Fully automatic electric programming controls provide for individual time cycles on a selected group of five kilns.
- Automatic off and on operation assures admission of enough steam to envelope all the blocks in the kiln without raising the temperature of any of them too fast.
- Same *Vapor-Therm "package" unit can deliver very high temperature saturated steam for drying.
- Better curing conditions surround the block, producing harder block, with improved color and less breakage from handling.

R. D. EMMONS
***VAPOR-THERM SYSTEM**
is

Better!
Faster!
Cheaper!

WE INVITE YOUR INQUIRIES

WRITE
WIRE
PHONE

**Patents Pending*

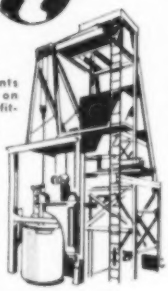
R. D. EMMONS • 303 Melrose Ave., Syracuse 6, N. Y., Phones: 9-6200, 9-8363

UNIVERSAL

Concrete products and their manufacture are the bread and butter of Universal's men in 19 plants scattered over 10 states. Now take pipe-making machines. Dozens of Universal men over a period of years have contributed improvements in design and construction. Advantages resulting from this accumulated experience has made Universal heavy-duty machines efficient profit makers for users everywhere. It's better to own Universal equipment than to compete against it.

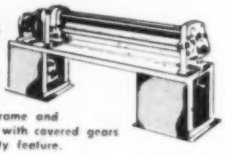
BUY OR LEASE UNIVERSAL PIPE MACHINES

Leasing arrangements can be arranged on terms that assure profitable operation. You needn't invest the entire purchase price to begin operation. Universal Pipe Machines true-tamp at 680 strokes a minute. Make quality, long-lasting pipe. Choose from four sizes: 5"-24", 6"-48", 12"-60", 24"-72". Write for full details.

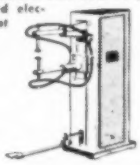


WIRE BENDING ROLLS . . .

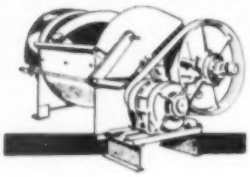
Bends reinforcing wire to any radius, accurately, quickly. Extra heavy frame and oversize bearings, with covered gears and overload safety feature.



WIRE MESH WELDER Specially designed for welding reinforcing wire but adaptable to other uses. Fully enclosed in steel water-cooled electrodes. Heat control switch. Foot pedal leaves both hands free.



UNIVERSAL CONCRETE MIXERS A real workhorse for manufacturers of concrete products. Simple, dependable. Capacities: 28, 42 and 50 cu. ft. Send for information.



Write today for details, prices.

Universal
CONCRETE MACHINERY CO.
297 South High Street — Columbus, Ohio

J. J. O'Farrell

John J. O'Farrell has been named management engineer in charge of the methods engineering, inventory control, and I.B.M. departments of the Hyster Company, Portland, Ore.

Working under Mr. O'Farrell are Sherman D. Bucher, supervisor of the inventory control department, and Leland R. Viar, supervisor of the methods engineering department.

Another recent Hyster appointment is that of Kirk Lowe to the position of pressed metals engineer in the manufacturing engineering department.

Now in charge of sub-contracting for the Hyster Company is Robert M. Remmen, who has been employed by the organization for the last 13 years.

In Los Angeles the Challenge Manufacturing Company, which manufactures transit-mix trucks, is erecting a 32,000-sq. ft. addition to its existing plant. It was revealed that the addition will enable the firm to increase its production by 50 percent and will require the hiring of about 35 workers when it is completed early next year. According to J. Ross Castendike, president of Challenge, this is the first of three projected additions which are expected to increase the company's output about 200 percent.

The Universal Form Clamp Company, whose headquarters are in Chicago, is making an initial investment of $60,000 in Oakland, Calif., for the development next year of a production operation to supply seven Western states, according to a statement released by B. R. Hoerr, manager of the firm's West Coast Division. A three-acre site was purchased for a 3,200-sq. ft. distributing plant. Next year the company plans to erect a production plant on the site at a cost of approximately $200,000. Universal is at present constructing a $250,000 plant in Dallas, Tex.

The Carter-Waters Corporation, 2440 Penway, Kasas City, Mo., is producing for commercial consumption its air-entraining agent "Air-Crete," a liquid added to concrete with water to produce "non-connecting air bubbles of microscopic proportions." According to Carter-Waters, this additive meets A.S.T.M. specifications. Special features claimed for this air-entraining agent are economy, durability, workability, and improved texture for the concrete.

Economy in time and materials is reportedly effected because the passage of capillary water is reduced; better insulation is provided against heat in the final product; the strength of lean concrete is increased; and bleeding, segregation (during transportation), and expansion are reduced.

NO, Doctor, there is no scientific laboratory formula for media selection. But experienced space buyers do have an effective and time-proven recipe for the profitable investment of advertising money—reasoning, judgement and experience PLUS THE USE OF FACTS. The basic advertising values of publications are reflected in the facts about their circulations. Also there are definite standards, mutually approved by buyers and sellers of advertising, by which circulations may be uniformly measured. Hence circulation facts, when reported in accordance with these standards, provide a dependable guide to sound advertising investments.

The information that makes it possible to measure advertising values based on circulation facts is given in the reports issued by the Audit Bureau of Circulations, a cooperative and nonprofit association of 3300 advertisers, advertising agencies and publishers. The Bureau has a staff of experienced, specially trained circulation auditors who make annual inspections and audits of the circulations of the publisher members. The factual data thus obtained is issued in the A.B.C. reports which are available to advertisers and agencies for use in comparing and selecting media.

Guesswork and waste in advertising are avoided when media is selected on the basis of the facts in A.B.C. reports. This business paper is a member of the Audit Bureau of Circulations. Ask for a copy of our A.B.C. report.

SEND THE RIGHT MESSAGE TO THE RIGHT PEOPLE

Paid subscriptions and renewals, as defined by A.B.C. standards, indicate a reader audience that has responded to a publication's editorial appeal. With the interests of readers thus identified, it becomes possible to reach specialized groups effectively with specialized advertising appeals.

The audited information in A.B.C. reports for business papers includes the following:

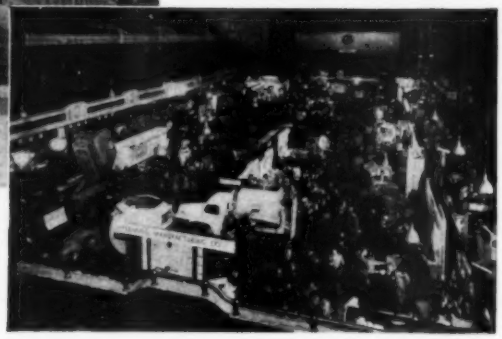
How much paid circulation.
How much unpaid circulation.
Prices paid by subscribers.
How the circulation was obtained.
Whether or not premiums were used as circulation inducements.
Where the circulation goes.
A breakdown of subscribers by occupation or business.
How many subscribers renewed.
How many are in arrears.

PIT AND QUARRY

A.B.C. REPORTS — FACTS AS THE BASIC MEASURE OF ADVERTISING VALUE

CONCRETE INDUSTRIES EXPOSITION

CLEVELAND PUBLIC AUDITORIUM JANUARY 22-23-24-25, 1951



SPONSORED AND PRESENTED BY THE

NATIONAL CONCRETE MASONRY ASSOCIATION

IN CONJUNCTION WITH ITS 31ST ANNUAL CONVENTION AS A SERVICE TO THE THOUSANDS OF CONCRETE PRODUCTS MANUFACTURERS THROUGHOUT THE UNITED STATES

CONCRETE PRODUCTS MEN!

This is YOUR Show

PLAN NOW TO BE THERE!

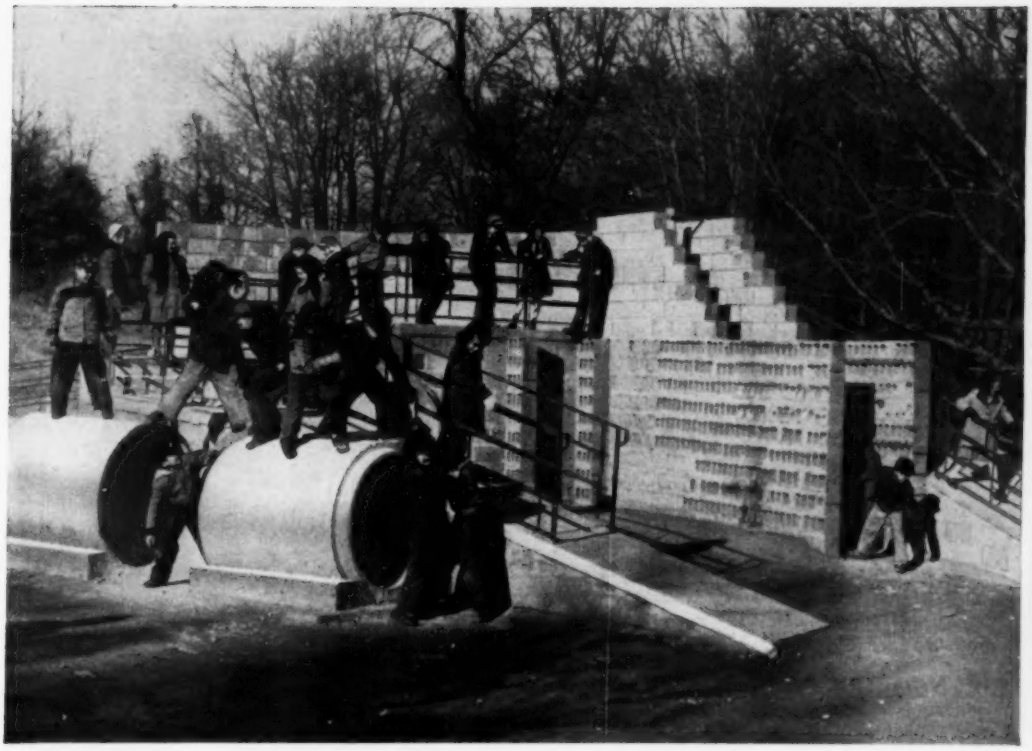
SEE THE LATEST! HEAR THE NEWEST!

See the machines, materials and methods that will make news and profits for you in 1951. See the biggest array of cost-saving, profit-making equipment and materials for the concrete products industry ever placed under one roof. Meet with experts in production, in research, in merchandising. Here in intimate, open-forum convention sessions you can talk over fundamental problems with men in your kind of business from all over the country. After four profitable days at the 1951 Convention and Exposition, you will go home with the solution to many of your problems and with many new, practical ideas that will improve your production and profits. You'll say your time was never better spent.

IMPORTANT!—MAKE YOUR HOTEL RESERVATIONS NOW—TODAY!

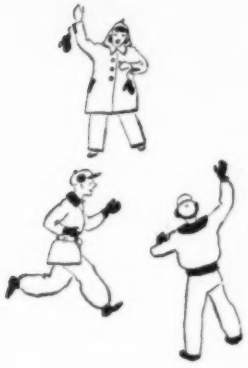
Address all reservations to: Louise D. Perkins, Director, Cleveland Housing Bureau, 511 Terminal Tower, Cleveland 13, Ohio

MENTION THAT YOU'LL ATTEND THE CONCRETE INDUSTRIES EXPOSITION



UNUSUAL USES

offer many opportunities for sale of concrete masonry units



New markets for concrete blocks and other precast units are opening up fast. Often you'll find them in the least expected places. The playground shown above is but one of many applications. Others are all about. They mean easy profitable sales for the manufacturer who looks and sees.

For much of this widely varied construction, blocks are made with Lehigh Air-Entraining Cement. Leading block manufacturers say it produces stronger, better-looking units . . . that its use results in smoother plant operations, fewer culls and throwbacks, greater all-round economy.

Whether you make special or standard units, try Lehigh Air-Entraining Cement with your own aggregate. You may find considerable difference in quality and costs. Our Service Department will be glad to assist you with your specific problems.

LEHIGH CEMENTS

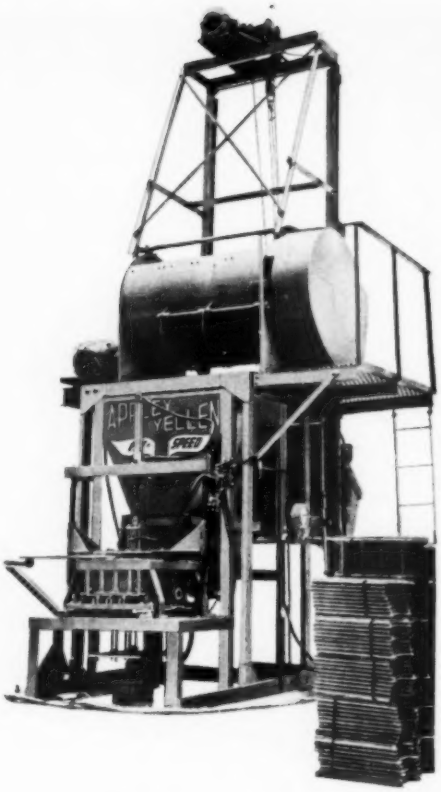
LEHIGH PORTLAND CEMENT COMPANY

ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

LEHIGH PORTLAND CEMENT • LEHIGH EARLY STRENGTH CEMENT • LEHIGH AIR-ENTRAINING CEMENT • LEHIGH MORTAR CEMENT

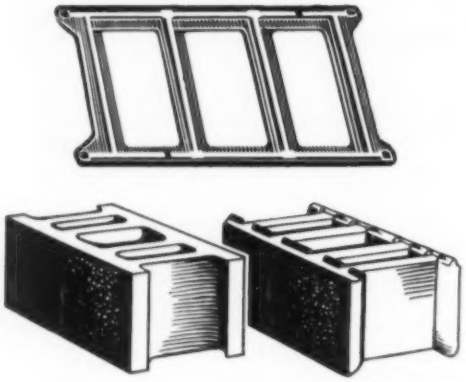
IT'S FAST— IT'S VERSATILE — and the Investment is LOW!

Mishco's Appley-Yellen Block Machine Assures You *High* Output With Nominal Investment Cost



It's Fast: Production of 400-500 blocks per hour (average for 8 hr. day) easily attained. Accurately timed and controlled cycles on automatic operation produce blocks of uniform density and size.

It's Versatile: Using only one core box with quickly interchangeable cores and the new type "R" reversible pallet, the Appley-Yellen Hi-Speed Block Machine can, with ease, produce any type of conventional or mortarless block. The close tolerances demanded by the mortarless block are no problem with this machine.



Low Investment: One machine, one set of pallets for both types of blocks! Made to jigs and fixtures, each machine the same. No high-price, high-pressure hydraulic parts and fittings — uses low (80-100 lb.) air pressure. Can be purchased as a single unit or complete plant with all allied equipment supplied.

Remember These Points

1. High productivity.
2. Very versatile (Conventional and mortarless blocks — all sizes and shapes).
3. Low investment (one machine, one set pallets).
4. Economical (few wearing parts — low pressure operation — automatic or semi-automatic control).
5. Rugged — designed and constructed for heavy-duty operation.
6. Simple to operate — finger-tip control.
7. Efficient — high productivity, accepts any aggregate — uniform product.
8. Steady vibration and forming head.

Get the facts! Write today for literature! Whether you need one machine or a complete plant, our consultant will gladly advise you without obligation.

MISHCO CORPORATION
615 S. W. 2nd AVE. · MIAMI, FLA.

49 HYSTER LIFT TRUCK DEALERS provide SERVICE and PARTS in U. S. and Canada

ALASKA
Northern Commercial Company, Seattle
ATLANTA, GA.
Wrenn Brothers
BALTIMORE, MD.
McColl-Boykin Co., Inc.
BIRMINGHAM, ALA.
S & T Equipment Co., Inc.
BROOKLYN, N. Y.
A. S. Rampell
BUFFALO, N. Y.
Rapids Handling Eqpt. Co. of Buffalo, Inc.
CALGARY, ALTA.
A. R. Williams Machry. Western, Ltd.
CHARLOTTE, N. C.
Wrenn Brothers
CHICAGO, ILL.
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Speer & Company
CLEVELAND, O.
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C. H. Collier Co., Inc.
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King & Kringel Machry. Corp.
DETROIT, MICH.
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A. R. Williams Machry. Co., Ltd.
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Electric Steel Foundry Co.
HOUSTON, TEX.
C. H. Collier Co., Inc.
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JACKSONVILLE, FLA.
Aichel Steel & Supply Co.
KANSAS CITY, MO.
Machinery & Supplies Co., Inc.
LOS ANGELES, CALIF.
Hyster Company
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Embry Brothers, Inc.
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Hyster Co. of Louisiana, Inc.
MILWAUKEE, WIS.
J. P. Waite, Inc.
MINNEAPOLIS, MINN.
W. S. Nott Co.
MOBILE, ALA.
S & T Equipment Co., Inc.
MONTREAL, P. Q.
A. R. Williams Machry. Co., Ltd.
NEW ORLEANS, LA.
Hyster Co. of Louisiana, Inc.
NEW ROCHELLE, N. Y.
Eastern Ind. Sales Co., Inc.
OTTAWA, ONT.
A. R. Williams Machry. Co., Ltd.
PEORIA, ILL.
Hyster Company
PHILADELPHIA, PA.
Rapids Handling Eqpt. Co. of Philadelphia, Inc.
PHOENIX, ARIZ.
Equipment Sales Co.
PITTSBURGH, PA.
Equipco Sales Co.
PORTLAND, ORE.
Hyster Sales Co.
RICHMOND, VA.
Richmond Auto Parts, Inc.
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Richmond Auto Parts, Inc.
ROCHESTER, N. Y.
Rapids Handling Eqpt. Co. of Buffalo, Inc.
ST. JOHNS, N. F.
City Service Co., Ltd.
ST. LOUIS, MO.
Shipping Utilities
SALT LAKE CITY, UTAH
Arnold Machry. Co., Inc.
SAN FRANCISCO, CALIF.
Hyster Company
SEATTLE, WASH.
Hyster Company
TORONTO, ONT.
A. R. Williams Machry. Co., Ltd.
UTICA, N. Y.
French Mill Supply Corp.
VANCOUVER, B. C.
A. R. Williams Machry. Western, Ltd.
VICTORIA, B. C.
A. R. Williams Machry. Western, Ltd.
WINNIPEG, MAN.
A. R. Williams Machry. Western, Ltd.
YUKON TERRITORY
Northern Commercial Company, Seattle

EVERY HYSTER DEALER IS A LIFT TRUCK SERVICE AND PARTS STATION... He has factory-trained mechanics skilled in maintenance and repair. He has an adequate supply of genuine Hyster parts. His service is quick, courteous, efficient on all Hyster lift trucks:

Model	Capacity	Model	Capacity
HYSTER 20	2,000 lbs.	M STRADDLE TRUCK	18,000 lbs.
HYSTER 40	4,000 lbs.	MH STRADDLE TRUCK	30,000 lbs.
HYSTER 75	7,500 lbs.	KARRY KRANE	10,000 lbs.
HYSTER 150	15,000 lbs.		

—and on these HYSTER *Salsbury* TURRET TRUCKS:

Model	Capacity	Model	Capacity
CARGO	4,000 lbs.	PLATFORM	4,000 lbs.
PALLET	4,000 lbs.	TUG (Towing)	20,000 lbs.

Call your nearest Hyster dealer when you need fast service and parts delivery.

HYSTER COMPANY

THREE FACTORIES

2926 N. E. CLACKAMAS STREET, PORTLAND 8, OREGON
1826 NORTH ADAMS STREET.....PEORIA 1, ILLINOIS
1026 MEYERS STREET.....DANVILLE, ILLINOIS

YODER
100-TON
Concrete Testing Machine

"Our Yoder Testing Machine showed us how to maintain quality with more economical mixes, saving from $15.00 to $20.00 per day, or over *$4000.00 per year*"

Report by one Concrete Products Manufacturer

. . . and that's only Part of the Saving!

In addition, figure the present cost of sending samples out for testing—most of which is saved.

Here's a rugged, accurate machine, so simple anyone can quickly learn how to make his own tests. The price is only $900.00 — the first and virtually the only cost.

This machine enables you to keep an accurate check on daily production and quality. Compression tests tell the story quickly. Equally important, when something does go wrong, fracture examination helps you quickly discover just *what* is wrong. So you save much time in determining whether the trouble is due to faulty aggregate, proportioning, segregation, mixing, molding or curing.

Investigate! Send for illustrated brochure containing useful information on the machine itself as well as the many advantages of testing concrete products in your own plant.

Concrete Machinery Division
THE YODER COMPANY
5550 Walworth Avenue, Cleveland 2, Ohio

ENGINEERING YODER MANUFACTURING

SMITH Scores another FIRST!

A WINNING COMBINATION — Smith Tilting Mixers for pre-mixing or pre-shrinking concrete and Smith-Mobile Agitators for delivering the concrete to the job.

Announces New Smith-Mobile 6½ Yard Truck Mixer — 8⅝ Yard Agitator

You'll like this new "King" size Smith-Mobile. It's BIG in capacity and BIG in value . . . backed by SMITH, the acknowledged leader in the industry for more than 50 years.

The new 6½ yard machine enables you to **deliver more yards of concrete per man hour and per truck hour.** It is designed to load, mix and discharge, at record speed, even dry or low slump batches. Handles critical concrete to the satisfaction of engineers, contractors and operators, no matter how rigid the specifications. Low weight. Built of the toughest, wear-resistant materials. Conforms to NRMCA standards.

Some of the country's biggest operators have already ordered a large number of these 6½ yard machines for use in New York, Boston, Los Angeles, Chicago and other cities.

Wherever operating conditions make bigger loads possible, this 6½ — 8⅝ yard job will save you a lot of dollars. Available in both standard models and the now famous LOADLIMIT models. Get the facts. Write for catalog.

THE T. L. SMITH COMPANY
2887 N. 32nd St., Milwaukee 45, Wis., U. S. A.

SMITH MOBILE

For BIGGER and BETTER Concrete Mixers and Truck Mixers Look to SMITH

A 5846-1P

Concrete Manufacturer Classified Section

Advertising rate per issue: $10.00 a column inch. 10% discount for 4 consecutive issues. (Lower rates on a contract basis.) Advertisements received by December 23, will appear in the January issue.

$295.00 SALE

(Good Used and New Equipment)

1—Used Monarch Silo-Stave machine	$295.00
1—Used Slab 20' length equipment	295.00
1—Used Septic Tank mold (like new)	295.00
1—Used Burial Vault mold (like new)	295.00
1—(New) Chimney Block machine	295.00
1—(New) Curved Block machine	295.00
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1—(New) Drain Tile machine	295.00
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50—(New) Flagstone molds (one lot)	295.00
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30—(New) Highway sign post molds	295.00
30—(New) Street Marker Post molds	295.00
30—(New) Land Marker Post molds	295.00
30—(New) Gutter pipe (½ circle) molds	295.00
10—(New) (Lintel saml-hollow) molds	295.00
6—(New) Cattle watering trough molds	295.00

18,000 used pallets any size, each ..... .30

"WE GUARANTEE EVERYTHING"

CHASE CONCRETE MACHINERY CO.

15 Linwood Avenue — Buffalo 2, N. Y.
— Telephone: Lincoln 0918 —

CEMENT COLORS

Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 24 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages.

manufactured by
LANDERS-SEGAL COLOR CO.
71 Delevan St. Brooklyn 31, N. Y.

TRUCK MIXERS
Priced to Sell

2 Jaeger 1948 2 Yd. Hi-Dumps Mounted on 1948 GMC Model 453. Excellent Condtion.

AMERICAN CONCRETE SERVICE
P.O. Box 414 Hamilton, Ohio
Phone: 3-3511

"SHALITE"

An expanded shale aggregate for lightweight block and concrete

AVAILABLE NOW

POSTON BRICK & CONCRETE PRODUCTS CO.
SPRINGFIELD, ILLINOIS Phone 83404

WANTED

1—12" attachment for Stearns Joltcrete No. 9 complete with pallets.

GRANITE CONCRETE BLOCK CO.
29 West Avenue Elyria, Ohio

BLOCK PLANT WANTED

Must be in good condition—with Pallets, Racks, Machine and preferably two bag mixer unit.
Interested in either Lith-I-Block or Columbia (2 block automatic) machine.
Quote selling price.

Box No. R 5, c/o Concrete Manufacturer
538 So. Clark Street Chicago 5, Illinois

WANTED
BRICK MACHINE
BLOCK MACHINE

Dunbrik or other make brick machine. Lith-I-Bar or similar type block machine using plain pallets. Send information and lowest price. Will arrange to inspect. Write:

WILLIAM F. COLE
3557 Shelmire Street, Philadelphia 36, Pennsylvania

FOR SALE
SILO EQUIPMENT

New Monarch hydraulic stave Machine Door Frame machine and pallets Run only four days.

MACLAY CONCRETE COMPANY
Festus, Missouri

IDLE EQUIPMENT WASTES MONEY

A good way to get back a large part of the money you spent for equipment you're no longer using is to SELL IT.

And the best way to sell it is through the Concrete Manufacturer, the Market Place for supplies and services.

Let someone else have the benefit of equipment you can't use in exchange for hard cash you can use in other ways.

So important is the Concrete Manufacturer used equipment section that many readers (and there are over 24,000 of them—all potential buyers) turn to it first when C M arrives on their desk.

Tell us what you have to offer for sale or trade, we'll set up the ad for you. Mail today and watch the results.

THE CONCRETE MANUFACTURER, 538 South Clark Street, Chicago 5, Ill.

CONCRETE MANUFACTURER CLASSIFIED SECTION

GRANULITE

Can be the answer to your light weight aggregate problem.

Phone
ANdover 3-2664
For Information
or write

THE GRANULITE COMPANY
605 W. Washington Street
CHICAGO 6, ILLINOIS

UNBREAKABLE PALLET RINGS

Write for full information

TEXAS FOUNDRIES
LUFKIN, TEXAS

AN OPPORTUNITY to purchase a block manufacturing business 100 miles from Chicago. Established five years. Despite cement shortage, cramped quarters and insufficient production facilities, sales this year will approximate $145,000.00. Recent health development causes us to seriously reconsider installation of new Besser equipment in new spacious home which we recently purchased. We will either lease or sell you our new quarters and you can install your own equipment.

Box No. R 4, c/o Concrete Manufacturer
538 So. Clark Street — Chicago 5, Illinois

FOR SALE

ONE LITH-I-BAR 2-BLOCK FULLY AUTOMATIC MACHINE
LIKE NEW. 10 MONTHS OLD.
PHONE OR WRITE:

THOMAS LUMBER COMPANY
P. O. Box 993 — ORLANDO, FLORIDA
Phone: 4107

FOR SALE

Northwest Crane — Serial #1298 — Model 105 — 55' boom. Twin City Gas Motor—machine in service every day—equipped with bucket.
Thomas Two Speed Slackline Cableway Hoist #8075 equipped with 100 H.P., 3 phase, 60 cycle, 220 volt continuous duty slip ring type motor with variable speed control apparatus.

ROCK RIVER READY MIX
Dixon, Illinois

FOR SALE

1 Besser Super K-3 Tamper. (Inc. Motor)
3700 Steel Pallets
92 Racks
1 Block conveyor
Pneumatic Offbearing Hoist

LINCOLN CONCRETE PRODUCTS COMPANY
26400 West Eight Mile Road, Detroit 19, Michigan

FOR SALE

Double Drum Hoist with 100 H. P. Electric Motor. A-1 Condition.

B. L. LARSEN & SON
Cedar Falls — Iowa

FOR SALE

One twelve inch mold box for Fleming block machine. New. 500 new wood pallets for twelve inch block. 1000 new aluminum four inch pallets. One Pak-Crete machine used two seasons.

ADAMS CONCRETE PRODUCTS
Wittenberg, Wisconsin — Phone 44R2

YOURS TO SERVE

If you have not found the equipment you are looking for, the research dept. of The Concrete Manufacturer can and will gladly assist you. Tell us what it is . . . Write to

Research Dept.
C/O The Concrete Manufacturer
538 S. Clark St. — Chicago 5, Illinois

SPACE HEATERS

War Surplus Bargain

New — Ready To Use!

40,000 BTU capacity

—Burning gasoline, kerosene or diesel fuel.
—Electric blower—12 V. DC or 110 V. AC using small transformer which we furnish with each heater.

Portable, Quick, Clean Heat

Ideal for curing room, concrete plants, work under construction, emergency heat, or auxiliary heaters.

$95.00 each

Clapp, Riley and Hall Co.
14 No. Clinton St.,
Chicago 6, Illinois

FOR SALE

1 Kent Tamper Stripper with Vibrator attachments.
11 Cu. ft. Kent Batch mixer. Elevator Loader.
700—8" Cored Pallets.
100—Steel Pallets, Cored—8".
1 Stearns model 7. Joltcrete.
8" Attachments. 18 Cu. ft. Stearns mixer.
18 Cu. ft. Skip Hoist. 2000—50% Pallets.
200—8", 50% Sash Pallets.

Both above machines can be seen in operation.

Box No. R 2 — c/o Concrete Manufacturer
538 So. Clark St., Chicago 5, Illinois

MINERAL COLORS

for

BRICK MORTAR
STUCCO-PLASTER-CONCRETE

"Fine Because of Their Fineness"
Ask for samples and recommendations.

BLUE RIDGE TALC CO., INC.
HENRY, VIRGINIA

FOR SALE

1000 Steel pallets— 8½" x 18"
3000 Steel pallets—12½" x 18"
1—Michigan ⅜ yd. shovel front

NIEB CONCRETE PRODUCTS COMPANY
NILES, MICHIGAN — Phone: 1512-W

FOR SALE

Practically new Marvel Drain Tile Machine with 4" 7 6" attachments.
Used only two weeks.—Price $300.00 including motor.—FOB Russellville, Kentucky.

RUSSELLVILLE CONCRETE PRODUCTS COMPANY
Russellville, Kentucky

FOR SALE

Atlas Car Unloader with 3 H.P. 220 volt, 3 phase, motorized reducer, on steel wheels. Unloaded only 2 carloads of material. Nice discount.

POPP CONCRETE PRODUCTS COMPANY
Neenah, Wisconsin

NOTICE TO OWNERS OF NO. 9 JOLTCRETES

We have a large stock of repair parts, boxes and pallets at prices less than new parts. Write for list.

EQUIPMENT SERVICE COMPANY
Roanoke 4, Virginia
Phone Mr. Comer
8872 or write P. O. Box 838

TRUCK MIXERS, USED REBUILT

2—JAEGER, 1947, 2 Cu. Yd., High-discharge, Two-compartment Tank, Separate Engine Drive (Continental), mounted on Tandem Axle KB6F International Truck, 6.66 to 1 gear ratio, 151" Wheel Base, Truck purchased new March, 1948, Truck Mileage approx. 35,000, Tires 8:25 all way around, general condition good.

1—JAEGER, 2 Cu. Yd. Hatch Loader, general condition rough.

1—SMITH, 1946, 2 Cu. Yd., High-discharge, 2-compartment Water Tank, mounted on 1947 Heavy Duty Reo Truck, cleaned and painted.

2—SMITH, 1947, 3 Cu. Yd., High-discharge, 2-compartment Water Tank, Rebuilt, cleaned and painted.

4—SMITH, 1946, 4 Cu. Yd., 2-compartment Water Tank, completely rebuilt, sanded and painted; power units completely overhauled.

4—SMITH, 3 Cu. Yd., good operating condition, mounted on Cab-over White WA-122 Trucks, Trucks & Mixers 1941-46 Models.

Complete information furnished upon request.

FUNKHOUSER MACHINERY CO.
2425 Jefferson — Kansas City, Missouri
Harrison 4366

FOR SALE

One used Butler 225 Bbl. cement bin with long legs; 1000 lb. used Butler cement batcher; 35' chain belt cement elevator with gasoline engine, etc.

One used Blaw-Knox 51-ton 2-compartment bin with used 1 cu. yd. weighing batcher.

Two used 3-yard horizontal discharge Jaeger machines mounted on model 502 GMC trucks with Grico tandem axles.

All of the above in good condition and working every day. Address **Foster Supply Co., P. O. Box 535, Port Huron, Michigan.**

FOR SALE

LITH-I-BAR block machine, 28' Besser Batch Mixer. F. C. George Conveyor—Extra Mold Boxes & Attachments for making all type blocks and bricks.
All equipment in good running condition.

Terms $6500.00 Cash F.O.B.
Delray Beach, Florida.

Also 2500 18"x18"x¼" Steel Pallets to be sold at $1.00 each.

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AGGREGATES FOR SALE

Lightweight fire safe 50 to 70 lbs. per cu. ft.
Cinders Kiln made
Burned red shale
Expanded shale
High carbon shale for cement, Brick or Centering plants
Also heavy aggregates 150 to 200 lbs. per cu. ft.
All aggregates processed ready to use.

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Both McCracken Type and Martin Trowelers—PROVED to last as long or longer — yet cost considerably less. Write for prices.

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Check these Features

- Finger-tip single valve control for easy operation.
- Variable speed drive on hydraulic pump.
- Timken bearing-equipped turntable, grease-sealed for life, with automatic locking.
- Easily replaced packer shaft, mounted on lifetime Timken bearings, with oversize stuffing box to protect against sand and grit.
- V-Belt and chain drive throughout, with oversize Twin Disc clutches.
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These are just a few of many outstanding features of Dixon Model "C" Hydraulic Pipe Machines . . . features that mean money in your pocket because they contribute to faster production, lower operating costs, better pipe and higher profits. Write today for complete information.

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Plant: 4600 Washington Avenue
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Manufacturers of:

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Pipe Bend Machines
Dixon Mixers

Dixon Conveyors
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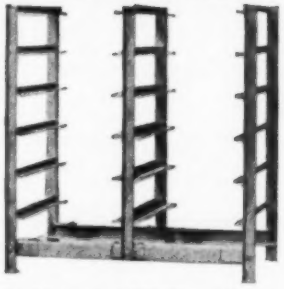
Corrosion-Resistant Hi-Strength Alloy Steel



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Sturdy construction
•
any style or capacity
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Shipped knocked down
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Rigid Field connections
•
assembled Easily

CHASE Foundry & Mfg. Co.

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YOU'LL MAKE MORE BLOCKS WITH A *Columbia!*

HERE'S WHY

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- VIBRATION PLUS COMPRESSION
- 4-6 AND 8 INCH HIGH BLOCKS
- 4 TO 6 PALLETS PER MINUTE
- OIL HYDRAULIC
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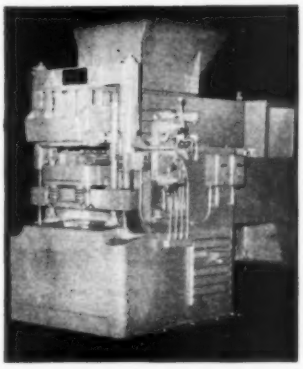
- AUTOMATIC OR SEMI-AUTOMATIC

• WRITE TODAY FOR COMPLETE INFORMATION!



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Eliminate Supply Bottlenecks ! Stop Crushing Headaches

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T-H-O-U-S-A-N-D-S of PADDLE STROKES GIVE *Incomparable* MIXING RESULTS— with the KENT CONTINUOUS METHOD

WRITE FOR BULLETINS Describing All 3 *KENT* Continuous Mixers

For better mixing and greater profits all facts favor KENT Continuous mixing.

52 paddles slice, cut over and back turn the aggregate thousands of times in trough of mixer before mix is discharged at a steady flow into hopper of Block Machine.

Through use of variable speed Drive, the Kent Stediflo can be set for any desired amount of mix to suit any production block machine on the market today.

Once adjusted, the machine operates automatically, releasing a man for other profitable work. Less power is required than other mixers effecting sizable current savings.

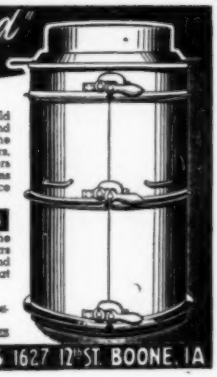
Kent Mixers are easily adjusted to the exact needs of all aggregates.

Kent Stediflo Mixers are serving the largest of block machines with complete satisfaction. Sizes are also adaptable for smaller installations, all operating on the same principle.

The **KENT MACHINE CO.** Cuyahoga Falls, Ohio

Manufacturers of* CONCRETE PRODUCTS MACHINERY *Since 1925

THE "Quinn Standard" FOR CONCRETE PIPE



The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and testimonies sent on request.

Also manufacturers QUINN CONCRETE PIPE MACHINES

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Now 85 LICENSED MANUFACTURERS Producing

Patented

homeward *Concrete* **STEPS**

A Small Investment That Pays Big Dividends

Homeward all metal forms are precision built to produce a product that requires no hand finishing.

The exclusive franchise for your territory may still be open.

For Complete Information Write

ROGER F. WILLIAMS, Licensor

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LET'S GO "Commercial"

RIBBED STEEL PALLETS

for "CLOSE CLEARANCE" in making sharp-edged Concrete Blocks

"Commercial" Oval Cored Steel Pallets are made so accurately that clearance between pallet and mold box is held to 1/16", insuring sharp-edged units with high "customer appeal."

"Commercial" Ribbed Pallets are rigid and unbreakable, and give years of service without replacement. They are the only type of steel pallets providing mortar grooves on both ends and bottom of concrete building units — your assurance of stronger bonded joints. "Commercial" supplies the most complete line of pallets available.

This Booklet has full details →

THE COMMERCIAL SHEARING & STAMPING CO.
YOUNGSTOWN 1, OHIO

Available Soon

THE MULTICO "LITTLE BEAVER"

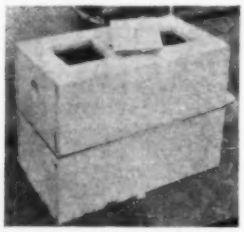
New High Speed, Low Cost Concrete Block Machine

THE MULTIPLEX MACHINERY CORP.
ELMORE, OHIO

The "Right Angle" on Septic Tanks

CARPENTER EQUIPMENT

saves time and labor, because it insures faster setting up, stripping, resetting, pouring, and handling. You get larger output. Only one man makes the delivery with a Carpenter Delivery Rig.



Used Coast to Coast

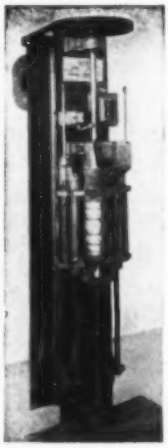
CARPENTER MFG. CO.

Phone 22018, R.F.D. 1, Box 470
RICHMOND 23, VA.

The ACE

An Entirely NEW - Completely DIFFERENT CONCRETE DRAIN TILE MACHINE

EASY TO OPERATE
LOW MAINTENANCE COST
NO GEARS NO CAMS
NO CLUTCH



The ACE is the concrete drain tile machine you have been looking for. Developed after an extensive survey to determine what concrete products men wanted in a drain tile machine, the ACE features a Packer-type combination head and shoes cast in one piece to assure a perfect tile.

GE or Westinghouse 1200 RPM Ball-bearing motor and Stop and Go switch. Finest quality air cylinder, oversize, positive action, precision mounted, heavy-duty construction throughout. Just push the switch, apply the air control valve and the ACE is working for you making a product you'll be proud to sell.

With 2,000 drain tile a day made on the ACE placed on your yard at less than 3½ cents each—now check with the sales price of Concrete Drain Tile in your territory. Then figure your profit—do this today.

WRITE, PHONE OR WIRE FOR DETAILED INFORMATION

DUGAS & COMPANY

962 MARIETTA STREET ATLANTA, GEORGIA

CONCRETE MANUFACTURER

RESEARCH DEPARTMENT

538 South Clark Street Chicago 5, Illinois

Please send me catalogs and prices concerning the following items checked below:

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- ☐ Air Compressors
- ☐ Air Entraining Agents
- ☐ Autoclaves
- ☐ Bag Cleaners
- ☐ Batchers
- ☐ Batching Plants
- ☐ Belting (Rubber)
- ☐ Bin Gates
- ☐ Bin Level Controls
- ☐ Bins and Batching Equipment
- ☐ Blades, Masonry Saw
- ☐ Block and Brick Machine
- ☐ Boilers
- ☐ Bucket Loaders
- ☐ Buckets, Concrete
- ☐ Buckets, Elevators
- ☐ Buggies, Concrete
- ☐ Bulk Cement Handling Equipment
- ☐ Bulk Cement Storage Plants
- ☐ Calcium Chloride
- ☐ Car Pullers
- ☐ Colors, Cement and Mortar
- ☐ Conveyors, Belt
- ☐ Conveyors, Portable
- ☐ Conveyors, Screw
- ☐ Curing Agents
- ☐ Curing Equipment
- ☐ Cutters, Bar
- ☐ Dispersing Agents
- ☐ Flooring Systems
- ☐ Forms, (Pipe, Joist, Ornamental, etc.)
- ☐ Guns, Color Spray
- ☐ Hardening Agents
- ☐ Heaters, Concrete Mixer
- ☐ Hoisting Equipment, Concrete
- ☐ Hoppers
- ☐ Joist & Slab Machines
- ☐ Kilns, Curing Concrete
- ☐ Lift Trucks, Electric
- ☐ Lift Trucks, Gasoline
- ☐ Lift Trucks, Hand
- ☐ Lightweight Aggregates
- ☐ Meters, Entrained Air
- ☐ Meters, Water
- ☐ Meters, Sand Moisture
- ☐ Mixers, Concrete (Batch)
- ☐ Mixers, Concrete (Continuous)
- ☐ Mixers, Truck
- ☐ Mixing Plants, Central
- ☐ Molds, (Pipe, Joist, Ornamental, etc.)
- ☐ Off-Bearers
- ☐ Paints & Coatings, Concrete
- ☐ Pallets
- ☐ Pipe Machines
- ☐ Pumps, Concrete
- ☐ Racks, Curing (Concrete Masonry)
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- ☐ Regulators, Temperature
- ☐ Reinforcing Equipment
- ☐ Sand-Lime Brick Machinery
- ☐ Saws, Masonry
- ☐ Scales
- ☐ Silo Stave Machines
- ☐ Silos, Storage
- ☐ Skip Hoists
- ☐ Skip Loaders
- ☐ Testing Equipment
- ☐ Tile Machines, Drain
- ☐ Tile Machines, Roofing
- ☐ Tractors
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- ☐ Turntables
- ☐ Vibrators, Portable, Concrete
- ☐ Waterproofing & Dampproofing

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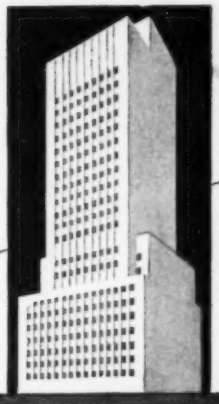
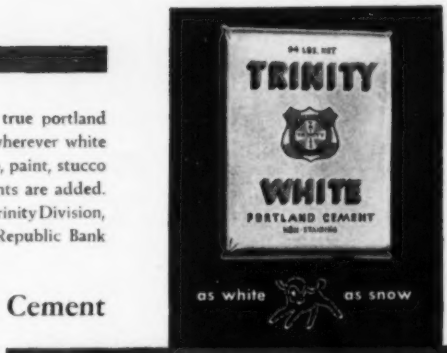


TRINITY WHITE
Portland Cement

For fine results use Trinity — the whitest white cement. A true portland cement that meets Federal and ASTM specifications. Use it wherever white cement is called for—in architectural concrete units, terrazzo, paint, stucco and all light-reflective uses. Gives pure colors when pigments are added. Standardize on Trinity White for appearance and satisfaction. Trinity Division, General Portland Cement Co., 111 W. Monroe St., Chicago; Republic Bank Bldg., Dallas; 816 W. 5th St., Los Angeles.

TRINITY WHITE is a *true* Portland Cement



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...with truck-man!"

And that's not hay! That's what block plant operators across the country tell us they save with this economical, rugged truck. One man's time . . . every day . . . the whole year 'round . . . *that* adds up!

You save up to $300.00 and more during the first month you put Truck-Man to work in your block or brick yard . . . and you continue to save at that rate during years of faithful, dependable Truck-Man service.

Truck-Man is a light, speedy, highly maneuverable truck that works a shift on little more than a gallon of gas . . . requires minimum maintenance . . . has simple controls any worker quickly learns to operate. The special 62" platform handles even 72 block racks . . . those extra big loads that mean more profit per trip between block machine and curing room. Various platform heights, widths and lengths available to suit your operation.

There's an extra dividend for you, too, in the gentle treatment your blocks get. Truck-Man's easy hydraulic lift and drop, soft *start* and *stop*, and rubber-cushioned ride spot your racks gently . . . no costly checking of green blocks to eat up profits.

New 1950 catalog describes three low-cost Truck-Man models. You owe it to yourself to get the whole story on this money-maker. Coupon brings your copy, at no obligation. Mail it now. Sales and service in 95 centers across the nation!

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*See also Detailed Information in 1950 Pit and Quarry HANDBOOK and Concrete Industries Yearbook

Here is the BIG PROFIT machine

THE MARVEL JR. — DRAIN TILE MACHINE

Included on the Marvel Jr. are numerous Pats. Pend. features of our Marvel Automatic. Now, no expensive, heavy, clumsy, in-the-way stationary machine is required.

MARVEL JR. is fast. Mounted on casters. Tile are off-beared directly onto the floor and machine pushed forward as necessary. Save steps! Speed production!

The Marvel Jr. with standard equipment makes 4-inch round drain tile. Attachments can be secured for making 3", 5", and 6" round drain tile and also 4" Hexagon shape drain tile.

We are also the largest manufacturer of SPECIALTY MOLDS for making lawn, garden, porch and other concrete ornamentals.

Write or wire

CONCRETE MACHINERY COMPANY
P. O. Box 2248 Hickory, North Carolina

VIBRAPAC USE AGREEMENT

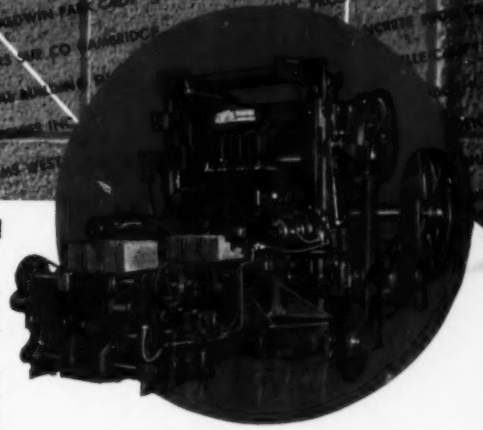
UNLOCKS THE DOOR TO GREATER SUCCESS

You Get EXTRA PROFITS from HIGHER PRODUCTION without Adding to Your Plant Investment!

Operators of concrete products plants like the Vibrapac Use Agreement. It enables them to expand their business without the necessity of borrowing considerable money from banks or other sources. It gives them available working capital which is necessary as volume increases.

During the past few years, the Concrete Products Industry has grown by leaps and bounds. That means more capital is required for general operations, such as office work, sales contacts, material handling and stock piling. The Vibrapac Use Agreement eliminates most of the capital requirements for machinery and equipment. Your extra profits from higher production, with lower operating cost, pay for the use of your plant equipment out of current production.

Write today for further particulars!

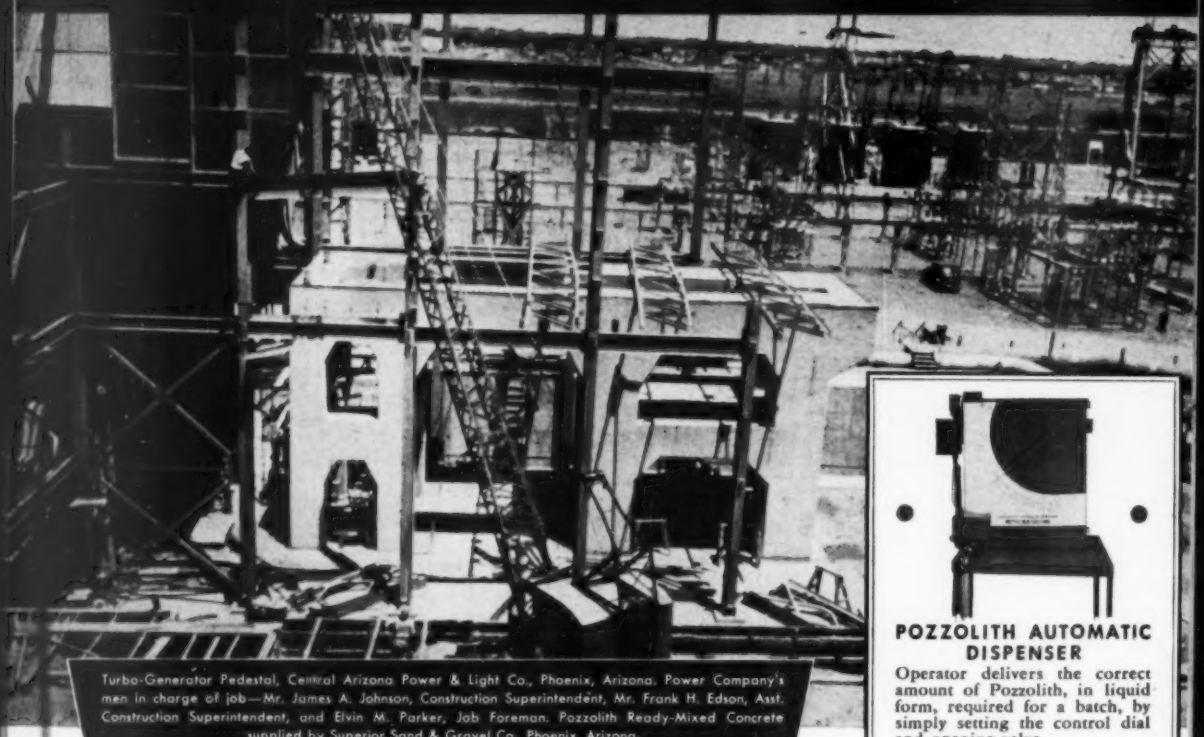


BESSER SUPER VIBRAPAC — the fully automatic concrete block machine. Produces three 7⅝" x 7⅝" x 15⅝" units at a time on one Plain Pallet. Smaller units made in larger multiples on the same pallets. Continuous, full capacity operation . . . fully automatic, including front feeding of pallets. Hand labor reduced to pushing a switch button and guiding a power off-bearing hoist.

BESSER MANUFACTURING CO., Alpena, Michigan, U.S.A.

BESSER

BATCH MIXERS · SKIP LOADERS · BLOCK & BRICK CUBERS · SUPER VIBRAPAC · AGLITE PLANTS · ACROW CRANES · ROOF TILE MACHINE



Turbo-Generator Pedestal, Central Arizona Power & Light Co., Phoenix, Arizona. Power Company's men in charge of job—Mr. James A. Johnson, Construction Superintendent, Mr. Frank H. Edson, Asst. Construction Superintendent, and Elvin M. Parker, Job Foreman. Pozzolith Ready-Mixed Concrete supplied by Superior Sand & Gravel Co., Phoenix, Arizona.

POZZOLITH READY-MIXED CONCRETE

Concrete of ideal placeability, readily mobile and with the correct cohesiveness essential to the successful pouring of this monolithic turbo-generator pedestal, was produced with Pozzolith by Superior Sand and Gravel Co., Arizona's leading ready-mixed company.

In addition to easy placeability and assured strength, Pozzolith Ready Mixed Concrete provides these advantages:

1. EASY, ACCURATE CONTROL
2. MINIMIZED SHRINKAGE
3. LOW PERMEABILITY
4. GOOD APPEARANCE
5. ECONOMY

Over 400 leading ready-mixed plants in all parts of the country are producing Pozzolith Concrete — and many top design engineers are specifying it — for these reasons.

Write for full information.

POZZOLITH AUTOMATIC DISPENSER

Operator delivers the correct amount of Pozzolith, in liquid form, required for a batch, by simply setting the control dial and opening valve.

OVER 400 LEADING READY-MIXED PLANTS ARE NOW EQUIPPED WITH THIS DEVICE . . .

WHY?

Because a producer can, at lower cost:

1. Produce concrete of low permeability . . . with normal Portland cement.
2. Produce high-early strength concrete . . . with normal Portland cement.
3. Produce air entrained concrete without strength loss . . . with normal Portland cement.
4. Produce all of the above properties out of one cement bin . . . with normal Portland cement — stepping up production, reducing inconvenience in handling and cutting costs.

In normal mixes, concrete of any given durability, strength and workability, is produced more economically with Pozzolith than by any other means.

the MASTER BUILDERS

CLEVELAND 3, OHIO TORONTO, ONTARIO

Save Money Screening

Fine to Medium-Coarse Materials

AERO-VIBE SCREEN

CHECK THESE FEATURES

- Vibrating mechanism is self-contained unit located above mechanism.
- Vibration adjustable by merely altering circular position of outer counterweights at end of shaft.
- Easy to remove vibrating mechanism — remove only eight bolts.
- True running drive — screen sheave does not vibrate with screen.
- Sizes 2 x 4 to 5 x 10 ft. Open or enclosed. 1 to 3 decks.

LOW FIRST COST plus low operating costs — no wonder crushing men have found this vibrating screen profitable for screening or rinsing operations in stone plants and in sand and gravel preparation.

Simple two-bearing Allis-Chalmers design has fewer parts, resulting in easy maintenance and low power costs. *Aero-Vibe* screens are built sturdily — they deliver a top-notch job of screening year after year despite tough-going service.

The Allis-Chalmers representative in your area will be glad to show you how *Aero-Vibe* screens can fit into your operations. Call him, or write for **Bulletin 07B6099.** A-3133

ALLIS-CHALMERS, 974A SO. 70 ST. MILWAUKEE, WIS.

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Aero-Vibe and *Texrope* are Allis-Chalmers trademarks.

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

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Controls

Texrope Drives

Vibrating Screens

Crushers

Kilns, Coolers, Dryers

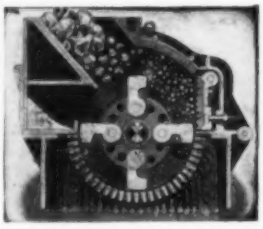
For Cost Reduction on Material Reduction...

WILLIAMS' "HEAVY-DUTY"

HAMMERMILLS

Built to take 6" feed and reduce to agricultural limestone, ¾" stone and other small sizes in *one operation!* Crushing occurs on unusually heavy breaker and grinding plate before reaching grate. This permits grates to be used for sizing only, minimizing wear. The result; more output, more quickly reduced at less operating cost.

Sectional view of Williams "Heavy-Duty" hammermill, with heavy liners and grinding plate for limestone and other hard material. Particular attention is directed to the grinding plate adjustment which assures uniform close contact of hammers and grinding plate at all times. Also note the metal trap which provides an outlet for the escape of tramp iron.



WILLIAMS ALSO MAKES...

Heavy-duty hammermills in smaller sizes for all quarry operations; impact and roller mills for 200 to 325 mesh grinding; drier mills; air separators; vibrating screens; steel bins; complete "packaged" crushing and grinding plants.

WILLIAMS PATENT CRUSHER AND PULVERIZER CO.
802 ST. LOUIS AVE. ST. LOUIS 6, MO.

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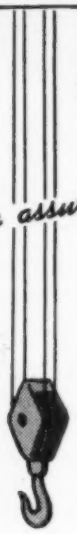
WILLIAMS
CRUSHERS GRINDERS SHREDDERS



PRETESTED
PREFORMED

your assurance of longer wire rope life!

Preformed
"HERCULES"
RED-STRAND
WIRE ROPE

Every wire that goes into "HERCULES" (Red-Strand) Wire Rope is first thoroughly tested in our Engineering Laboratory. Uniformity and safety, toughness and efficiency are thereby pre-determined to assure you of longer wire rope life!

We Invite Your Inquiries

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Chicago 7 Denver 2 Portland 9
Birmingham 6 Los Angeles 21 Seattle 4

Looking for Used Equipment?

Refer to the listings in this issue for a wide variety of used and surplus machinery and supplies.

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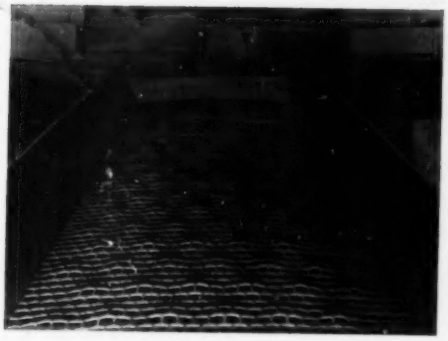
for Vibrating Screens . . .



Hendrick Perforated Metal Plate holds its uniformity of mesh throughout an unusually long service life. It can be heat-treated to increase its resistance to abrasion on tough jobs. Furnished either flat or corrugated, its full clearance obviates clogging. Labor costs are minimized because of the ease with which decks can be changed.

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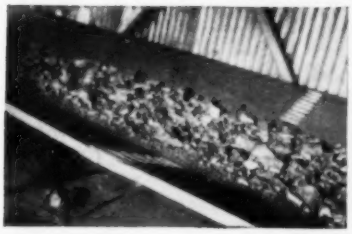

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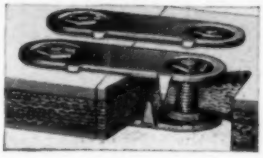

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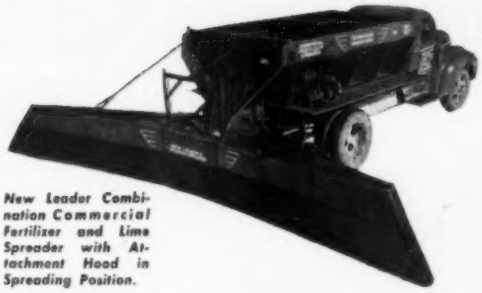

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20"	4	1/8"	1/32"
20"	5	1/8"	1/32"
24"	4	1/8"	1/32"
24"	5	1/8"	1/32"
26"	5	1/8"	1/32"
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30"	6	1/8"	1/16"

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Magnetic separators and pulleys
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I-R centr. pump 8", 3000 gpm 188' head
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Superior Diesel Model G. A. 4
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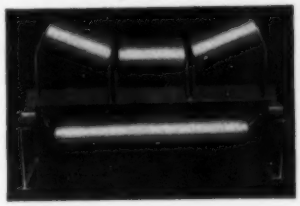
TROUGHING IDLERS AND ROLLERS



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14" belt	20.00	24" belt	$23.00
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42" belt			26.00

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30" belt	10.00	42" belt	11.50
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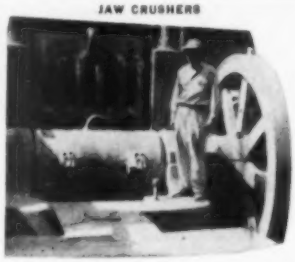

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285 HP Hall Scott gas Mod. 168, 6 cyl.	750
1600 HP Packard, new, gas Mod. V12	3,000
LeRoi-West Gas, KVA 1.60/120 NEW, Mod. 382	1,250
200 KW Gen. AC 3/60/440 D.C. 2 G.M. 671 Dsl.	7,000
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Chemical Engineer for Cement plant in middle west. State age, education, experience, references and salary expected.

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40 ton Orton diesel locomotive crane
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820 crawler. 2 yd. Shovel & drag. Cat. D13000. Over $1000 new spare parts. Ready for work.

41 crawler. ¾ yd. Crane, clam, drag, hoe. Cat. Diesel.

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5'x22'', 6'x22'', 6'x48'', 8'x22'' & 8'x36'' Hardinge Conical Ball Mills.
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Blake Type—9x16, 10x20, 12x24, 13x24, 13x30, 16x30, 18x36, 24x36, 30x42, 30x48, 40x48, 60x42, 84x60, 42x48 & 28x36
Single Toggle Type—9x16, 10x16, 11x18, 8x36, 10x20, 13x24, 18x30, 10x36, 13x36, 16x36, 20x36, 24x36, 10x40, 30x42
Can. & Roller Type—8x10, 6x20, 10x16, 10x20, 10x26, 11x18, 12x18, 13x28, 12x24, 12x36, 11x24, 11x26, 12x24, 14x26, 14x24, 15x36, 18x32, 9x40, 24x40, 32x50

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LANDIS heavy-duty, tried-and-true construction is the result of twenty-five years designing of specialized hauling equipment. This is your guarantee of fast, safe, economical hauling. Let LANDIS help you with your hauling problems.

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PICHER, OKLA.

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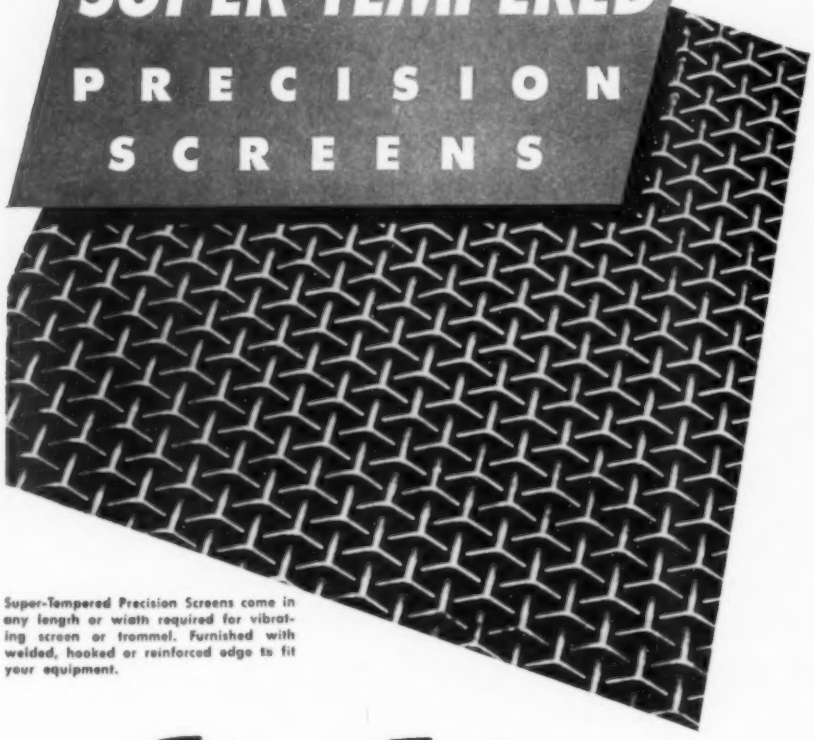
SUPER-TEMPERED
PRECISION SCREENS



Super-Tempered Precision Screens come in any length or width required for vibrating screen or trommel. Furnished with welded, hooked or reinforced edge to fit your equipment.

Tighter AND *Tougher*... FOR GREATER TONNAGE

TIGHTER . . . because Super-Tempered Precision Screens are woven on powerful hydraulic looms of our own exclusive design. These special machines weave the rods together so tightly they can't loosen up under the most severe vibration.

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All of which means that Super-Tempered Precision Screens give you longer, more accurate and dependable service . . . handle greater tonnage at lower cost.

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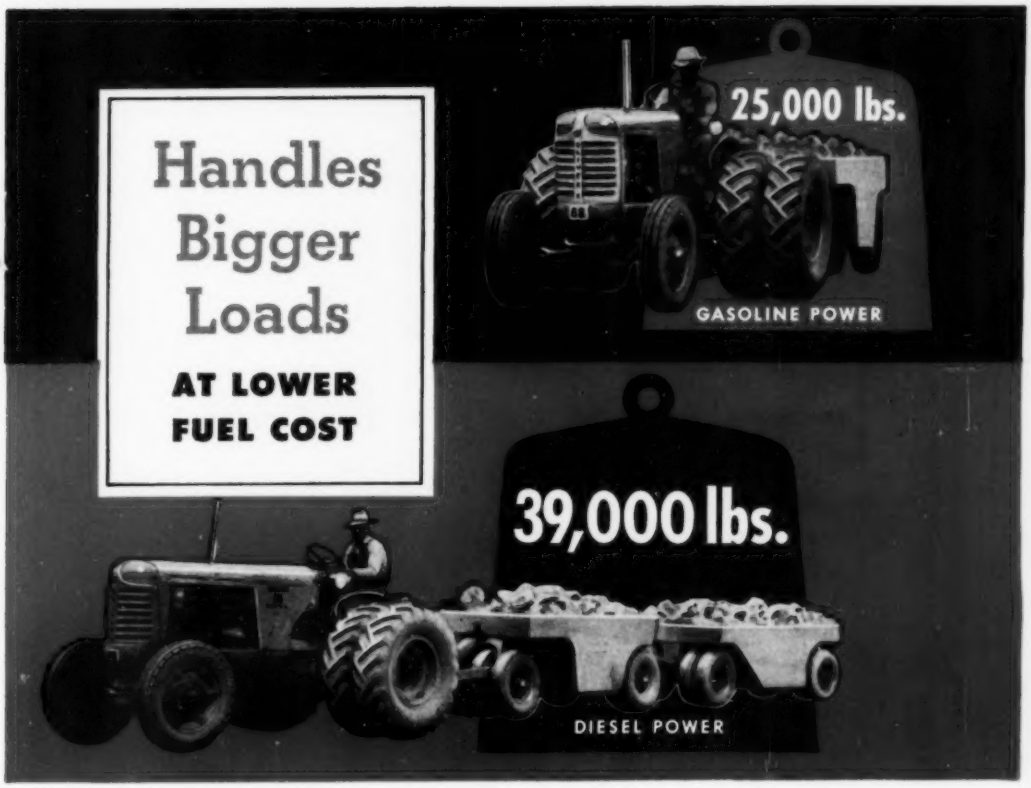
OLIVER DIESEL POWER



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The new Oliver "88" is a natural for industrial wheel tractor operations. It's remarkably easy to start . . . requires no starting preparations. Overall efficiency is high due to superior air and fuel mixture. Efficient burning of fuel and air assures exceptional fuel savings. Prolonged piston head pressure increases lugging ability under heavy loads.

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